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THE NORTH AMERICAN SPECIES OF THE GENUS LIMNOPHORA ROBINEAU-DESVOIDY, WITH DESCRIPTIONS OF NEW SPECIES (MUSCIDÆ, DIPTERA)

(Continued from page 76)

BY H. C. HUCKETT

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Limnophora (Spilogona) narina (Walker)

Anthomyia narina Walker, List Dipt. Brit. Museum, 1849 IV p. 933.—Walker, Canad. Ent., 1871 III p. 144.—Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 169.

Spilogaster narina Stein, Zeitschr. f. Hymen. u. Dipt., 1901, I Heft 4 p. 202.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 545.

Paralimnophora brunnesquama Malloch, Proc. U. S. Nat. Mus., 1913 XLV No. 2004 p. 605.

Limnophora nigrifrons Stein, Arch. f. Naturgesch., 1920 May (1918) Abt. A Heft 9 p. 49.

Limnophora narina Stein, Arch. f. Naturgesch., 1920 May (1918) Abt. A Heft 9 p. 57.

Limnophora velutina Malloch, Proc. Amer. Ent. Soc., 1920 June XLVI No. 802 p. 147.

Melanochelia velutina Malloch, Canad. Ent., 1921 LIII p. 62.

Paralimnophora velutina Johnson, Océ. Pap. Boston Soc. Nat. Hist., No. VII 1925 p. 230.—Johnson, Insect Fauna Biol. Surv. Mt. Desert Region, 1927 p. 208.

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Spilogona velutina Hockett, Mem. 101 N. Y. (Cornell) Agric. Exp. Station, 1928 (1926) p. 834.

RECORDS:—

Quebec, 1 ♂, Hemmingford, June 21, 1925; 1 ♀, July 25, 1925; 1 ♂, July 10, 1925. (G. H. Hammond) 2 ♂, Hemmingford, June 20, 1922; 1 ♂, June 26, 1922; 2 ♂, June 28, 1922. (C. E. Petch) 2 ♀, Hemmingford, June 29, 1922; 1 ♀, July 30, 1923. (A. D. Baker) 2 ♀, Covey Hill, June 25, 1927. (W. J. Brown)

Ontario, 1 ♂, Ottawa, June 19, 1914. (J. I. Beaulne) 1 ♂, 1 ♀, Waubamick, June 15 —; 1 ♀, Coniston, July 27 —. (H. S. Parish)

New Brunswick, 1 ♂, St. John's, June 23, 1901. (W. McIntosh) 3 ♀, Gornish, July 11, 1913.

Nova Scotia, 1 ♂, Truro, July 13, 1913; 1 ♂, July 16, 1913. (R. Matheson)

New Hampshire, 1 ♂, Base Mt. Washington, 2600 ft. (Fls. *Anaphalis*) Aug. 25, 1914. (C. H. T. Townsend)

Vermont, 2 ♀, Lynden, June 13, 1914. (A. L. Melander)

New York, 1 ♂, 1 ♀, Ringwood, Ithaca, June 13, 1922; 1 ♀, July 13, 1920; 1 ♂, McLean, Tompkins Co., July 9, 1921. (L. S. West) 1 ♀, Caroline-Harford, June 15, 1904; 1 ♀, Slaterville, Aug. 15, 1921; 1 ♂, Ithaca, July 19, 1920; 1 ♀, June 5, 1915.

Montana, 1 ♀, Bozeman, July 27, 1916. (Mont. Agric. Exp. Sta.)

British Columbia, 1 ♂, Rolla, July 23, 1927; 1 ♀, July 11, 1927. (P. N. Vroom)

The species is readily recognized on account of its characteristic appearance: in the male the eyes are as widely separated as in the female, the vertical and ocellar bristles are robust, being about equal in size to the first pair of dorsocentral bristles, and the calyptre are entirely blackish brown. The female differs markedly from the male in that the thorax is pale yellowish gray and the abdomen ochreous, both without any markings; the calyptre are whitish.

Specimens were sent to Mr. J. E. Collin, who made the necessary comparisons with Walker's type, a female, in the British Museum.

Limnophora (Spilogona) subrostrata Stein

Limnophora subrostrata Stein, Arch. f. Naturgesch., 1920 (1918)
Abt. A Heft 9 p. 54.

RECORDS:—

Alaska, 1 ♂, Katmai, 1917. (J. S. Hine)

British Columbia, 1 ♂, 2 ♀, Carbonate to Prairie Hills, July 12–18, 1908. (J. C. Bradley) 1 ♂, 7 ♀, Revelstoke Mountain, 6000 ft. Aug. 12, 1923. (E. R. Buckell) 1 ♂, London Hill Mine, Bear Lake, 7000 ft. July 28, 1903. (R. P. Currie)

Alberta, 1 ♂, Banff, July 19, 1922. (C. B. D. Garrett)

Washington, 1 ♂, 6 ♀, Paradise Park, Mt. Rainier, Aug. 1917; 1 ♂, 1 ♀, Squaw Lake, Mt. Rainier, Aug. 8, 1922; 1 ♂, 1 ♀, Ind. Henry, Mt. Rainier, Aug. 2, 1922; 1 ♂, Ararat Mt., Mt. Rainier, Aug. 5, 1922; 1 ♂, Crystal Mt., Mt. Rainier, Aug. 3, 1922. (A. L. Melander).

Colorado, 3 ♀, Long's Peak Trail, above timber line, July 20 —. (Cockerell)

The species was described from specimens collected by Dr. J. C. Bradley in British Columbia of which the above British Columbia specimens are at least representatives of the original series sent to Stein for determination. The species very closely resembles another from British Columbia, *sectata* (p. 112), differing in that the oral margin of *subrostrata* is slightly protruded beyond a level with base of antennæ and the calyptræ are whitish. In the female such differences are less apparent.

Limnophora (Spilogona) hyperborea (Boheman)

Aricia hyperborea Boheman, Öfversigt Kongl. Vetens. Akad. Förhandling., 1865 XXII p. 571.

?*Aricia labiosa* Boheman, Öfversigt Kongl. Vetens. Akad. Förhandling., 1865 XXII p. 571.

?*Aricia megastoma* Boheman in part, Öfversigt Kongl. Vetens. Akad. Förhandling., 1865 XXII p. 572.

Aricia dorsata Holmgren not Zetterstedt, Kongl. Svensk. Vetens. Akad. Handlung., 1869 VIII No. 5 p. 29.—Holmgren, Öfversigt Kongl. Vetens. Akad. Förhandling., 1873 (1872) No. 6 p. 101.—Holmgren, Ent. Tidskr., 1883 IV p. 167.—Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 164.

- Aricia fuliginosa* Holmgren, Kongl. Svensk. Vetens. Akad. Handlung., 1869 VIII No. 5 p. 30.
- Aricia conspurcata* Holmgren, Kongl. Svensk. Vetens. Akad. Handlung., 1869 VIII No. 5 p. 31.
- Aricia illota* Holmgren, Kongl. Svensk. Vetens. Akad. Handlung., 1869 VIII No. 5 p. 32.
- Limnophora conspurcata* Stein, Wien Ent. Zeitg., 1902 XXI p. 57.—Stein, Katal. Paläark. Dipt., 1907 III p. 670.
- Limnophora fuliginosa* Stein, Wien Ent. Zeitg., 1902 XXI p. 59.—Stein Katal. Paläark. Dipt., 1907 III p. 671.
- Limnophora illota* Stein, Wien Ent. Zeitg., 1902 XXI p. 59.—Stein, Katal. Paläark. Dipt., 1907 III p. 671.
- Hyetodesia dorsata* Aldrich not Zetterstedt, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 541.
- Limnophora frigida* Ringdahl, Ent. Tidskr., 1920 XLI p. 27.
- Limnophora pearyi* Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 151.
- Melanochelia pearyi* Malloch, Canad. Ent., 1921 LIII p. 63.
- Limnophora hyperborea* Collin, Ann. Mag. Nat. Hist., 1923 ser. 9 XI p. 117.—Collin, Ann. Mag. Nat. Hist., 1924 ser. 9 XIV p. 201.—Collin, Ann. Mag. Nat. Hist., 1925 ser. 9 XVI p. 336.
- Limnophora (Spilogona) hyperborea* Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 265.—Collin, Ann. Mag. Nat. Hist., 1931 ser. 10 VII p. 83.

RECORD:—

1 ♂, Nettilling Lake, Baffin Land, July 9, 1925. (J. D. Soper)
This species was described from Spitzbergen by Boheman (4), and is listed by Holmgren (15) under the name *dorsata* Zetterstedt as occurring in Greenland. This error in identification lead to the recording of *dorsata* as a North American species in the catalogues of Osten Sacken (36) and Aldrich (1). So far as I know the true *dorsata* has not yet been recognized as occurring in North America.

The above specimen from Baffin Land was submitted to Mr. J. E. Collin for identification, who reported that for *hyperborea* the specimen was very small and not typical except for the genitalia. I have quoted the synonymy given by Collin (6.6a). Holmgren (15) and Stein (56) have both regarded *hyperborea* as a synonym of *dorsata* Zetterstedt.

An examination of the type and allotype of *pearyi* Malloch revealed that there were no tangible differences between these specimens and those of *hyperborea* from Sweden, the latter being kindly furnished by Mr. Ringdahl. The male paratype of *pearyi* in the collection of the Illinois State Natural History Survey is in my opinion another species, differing essentially from the type in having a series of short bristles on proximal half of postero-ventral surface of hind femur, in lacking the median ventral bristle on mid tibia, and in not having the oral margin protruded beyond a level with base of antennæ.

The species keys to the same couplet with *subrostrata* from which it may be separated in both sexes by the possession of a few setulose hairs on dorsal margin of lateral declivities of scutellum adjacent the apical bristles, the sternopleural bristles are arranged in the order 1 : 2, and not 1 : 1. In the male the halteres are black, whereas in *subrostrata* they are yellow.

Limnophora (Spilogona) obsoleta Malloch

Limnophora obsoleta Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 149.—Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 203.

Melanochelia obsoleta Malloch, Canad. Ent., 1921 LIII p. 62.

Melanochelia hirticauda Malloch, Proc. Cal. Acad. Sci., 1921 4th ser. XII p. 181.

Limnophora (Spilogona) obsoleta Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 271.

RECORDS :—

Alaska, 1 ♂, St. Paul Island, July 12, 1920; 1 ♀, Aug. 10, 1920.

(G. D. Hanna) 1 ♂, 1 ♀, Savonoski, Naknek Lake, June 1919; 1 ♀, July 1919. (J. S. Hine) 1 ♀, Point Barrow, June 22, 1882. (John Murdock)

The species was described from Greenland. Later Malloch had the same species before him when he described *hirticauda* from St. Paul Island, Alaska, as indicated by a comparison of paratypes of *hirticauda* with the type of *obsoleta*. The species may be readily recognized by the abnormally small calyptræ. In this respect the species resembles the following, *melanosoma* (p. 110), the calyptræ of which are slightly larger. In addition,

both species possess one or more mid ventral bristles on mid tibia, the abdomen is uniformly deep seal brown in color, with no markings, and the face is noticeably blackened. However *obsoleta* may be distinguished from *melanosoma* through the possession of a series of short bristles on posteroventral surface of hind femur.

***Limnophora (Spilogona) melanosoma* new species**

MALE, blackish; head with grayish pruinescence on parafrontals and parafacials; cheeks and face of darker contrasting shade, the former velvety with brownish sheen, the latter blackish: antennæ and palpi blackish; proboscis pollinose. Thorax and abdomen largely blackish, concolorous; mesonotum with trace of pruinescence; humeral callosity grayish pruinose. Legs black, pulvilli brownish tinged. Wings slightly infuscated, more noticeably so on the membrane adjoining the veins, darker basad. Calyptre tinged with yellow: halteres brownish black.

Head with eyes separated by a distance equal to that between posterior ocelli; frontal vitta entire, narrowed caudad, distinctly separating the parafrontals; parafrontal bristles extended in series caudad to nearly a level with the anterior ocellus: parafacials at base of antennæ about as wide as average breadth of third antennal segment, but little narrowed ventrad: cheeks in height nearly equal to length of third antennal segment, the latter about one and a half times as long as broad.

Thorax with acrosticals setulose, the presutural setulæ in two irregularly paired series; with four pairs of postsutural dorsocentral bristles; scutellum with a few setulose hairs on dorsal margin of lateral declivities adjacent apical bristles: sternopleural bristles, 1: 1.

Abdomen subcylindrical, marginal and discal bristles of terga finely developed; basal sclerite of hypopygium with numerous erect bristles: processes of fifth sternum with a few fine bristles on distal half and having a small polished apical callosity on inner margin.

Fore tibia with no median posterior bristle: mid femur with a series of posteroventral bristles on proximal half; mid tibia with no anterodorsal bristle, with 2 or 3 posterior and 2 or 3 posteroventral to ventral bristles: hind femur with 5 or 6 anteroventral bristles on distal half; with no bristles on posteroventral surface; hind tibia with 2 to 4 anteroventral, 2 or 3 anterodorsal bristles, and 2 or 3 weaker posterior bristles. Costa with a distinctive series of short setulæ.

FEMALE, paler than male: head with parafrontals, parafacials, and cheeks brownish pruinose, the latter with dark reflections: mesonotum largely brownish infuscated, with three more or less distinctive vittæ, the sublaterals broader than and not as well defined as the dorsocentral vitta; scutellum with brownish marks laterad at basal angles; mesopleura largely brownish infuscated: abdomen grayish, subshining, with trace of ill-defined brownish

markings on terga 3, 4 and 5: wings clear or as in male; calyptræ yellowish; halteres yellow.

Head with parafrontals setulose; parafacials and cheeks much higher than breadth of third antennal segment, with numerous setulæ along the ventral half of facial margin. Abdomen with marginal and discal bristles stronger developed: ovipositor with spinules on anal plates. Fore tibia with or without a median posterior bristle: mid tibia with 1 or 2 anterodorsal, 2 or 3 posterodorsal, 1 posterventral, and 2 or 3 ventral bristles: hind legs similar to male: costa with a series of prominent setulæ.

Length 5.5 mm.

RECORDS:—

- 1 ♂, 2 ♀, Naknek Lake, Savonoski, Alaska, July, 1919; 2 ♀, August 1, 1919; 1 ♂, Katmai, Alaska, July, 1917. (J. S. Hine) Type and allotype in the collection of Professor J. S. Hine, Columbus, Ohio.

This species closely resembles *obsoleta*, but may be distinguished in both sexes from the latter by the lack of bristles on the proximal half of posteroventral surface of hind femur, the shorter setulæ on costa of wing, and by the slightly larger size of the lower scale of calyptræ.

Limnophora (*Spilogona*) *novæ-angliæ* Malloch

Limnophora novæ-angliæ Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 151.

Melanochelia novæ-angliæ Malloch, Canad. Ent. 1921 LIII p. 62.

Spilogona novæ-angliæ Malloch, Psyche, 1924 XXXI No. 5 p. 201.—Johnson, Occ. Pap. Boston Soc. Nat. Hist. No. VII., 1925 p. 229.

RECORDS:—

Quebec, 1 ♀, Kazubazua, June 6–10, 1927. (W. J. Brown)

Ontario, 1 ♀, Kearney, June 20, 1926; 1 ♂, Sand Lake, July 1, 1926. (F. P. Ide)

New Brunswick, 1 ♂, Fredericton, June 15, 1920, on fir. (R. P. Gorham)

Maine, 1 ♂, S. W. Harbor, Sept. 6, 1922. (C. W. Johnson)

New Hampshire, 1 ♀, base Mt. Washington, 2600 ft. Aug. 22, 1914; 2 ♂, Bretton Woods, 2000 ft. Aug. 23, 1914. (C. H. Townsend)

British Columbia, 1 ♀, Hedley, 7000 ft. July 23, 1923. (C. B. D. Garrett) 1 ♀, Grouse Mt. Vancouver, Sept. 3, 1926. (J. Stanley)

Alaska, 1 ♂, Katmai, July, 1917; 1 ♀, Naknek Lake, Savonoski, Aug. 1, 1919; 1 ♀, Aug. 14, 1919. (J. S. Hine)

The species was described from Maine and Labrador, and evidently occurs throughout the Canadian life zone extending West to British Columbia and Alaska. Malloch (31) has compared the species to *brunneisquama* Zett., from which it may be readily separated by the presence of longish bristles on proximal half of posteroventral surface of hind femur. Stein (60) has recorded *brunneisquama* (= *armipes* Stein) as occurring in North America, but, in my opinion, the record should be verified by an examination of the specimens before being accepted.

The species is most closely related to the following, *sectata*, the males of both species having the characteristic yellowish calyptræ, the deeply incised fifth sternum, and similar bristling on the mid tibia. In the above series of specimens all the females and only one male possess a strong median ventral bristle on mid tibia in addition to the robust median posteroventral bristle. In the females the second, third, and fourth segments of fore tarsi are noticeably broadened in contrast to the cylindrical shape of the first segment.

***Limnophora (Spilogona) sectata* new species**

MALE, blackish: head with parafrontals, parafacials, and cheeks grayish pruinose with dark reflections; frontal vitta black, opaque; antennæ and palpi black; frontal triangle and proboscis polished. Thorax blackish, subshining; mesonotum with trace of brownish pruinescence; presutural area with median vitta; scutellum entirely black. Abdomen largely blackish, subshining, with grayish pruinose areas restricted to cephalolateral angles of terga, 3, 4, 5, into which the tergal markings become more or less merged; terga 1+2 entirely blackish, terga 3, 4 and 5 with expansive black markings; basal sclerites of hypopygium blackened, shining. Legs black, pulvilli yellowish brown. Wings infuscated, blackened basad. Calyptræ intensively yellowish: halteres deep yellow.

Head with eyes separated by a distance about equal to that between posterior ocelli exclusive; frontal vitta reduced to lineal proportions caudad, barely separating the parafrontals: parafacials at base of antennæ not as broad as width of third antennal segment: cheeks equal in height to breadth of third antennal segment, with a series of short upturned bristles along

the ventral margin: antennæ small, third segment slightly longer than second; arista with minute pubescence.

Thorax with presutural acrosticals setulose; with four pairs of postsutural dorsocentral bristles; sternopleural bristles, 1: 1.

Abdomen conical, markings expansive, ill-defined and reaching to ventral regions of terga, those on tergum 3 trapezoidal and obscurely divided at middle, those on tergum 4 subtriangular, smaller, and more distinctly divided at middle, those on tergum 5 reduced; sterna 2 and 3 broader than long, sternum 5 deeply incised, with a few short setulæ and fine bristles laterad.

Fore tibia with no median posterior bristle; mid femur with a series of 5 or 6 bristles on proximal half of posteroventral surface; mid tibia with 1 anterodorsal, 1 or 2 posterior, 1 median posteroventral, and in addition 2 short median ventral bristles; hind legs missing (compare those of female). Wings with costal thorn inconspicuous, with veins *R.* 4+5 and *M.* 1+2 slightly divergent toward wing margin. Length, 5.5 mm.

FEMALE, paler than male, otherwise similar; frontal vitta deep black; frontal triangle brownish pruinose; thorax densely grayish pruinose with brownish markings; mesonotum with a median vitta and irregular markings laterad; scutellum with brownish spots at basal angles; abdomen grayish pruinose, subshining, with large brownish markings on terga 1+2, 3, and 4, and a median vitta on tergum 5. Wings clear, with trace of yellowish tinge basad; veins yellowish brown, becoming paler basad: *r-m* and *m-cu* cross veins clouded obscurely.

Eyes separated by a distance slightly greater than one third the maximum width of head; parafrontals with short irregularly developed bristles; para-facials at base of antennæ as wide as breadth of third antennal segment. Abdomen with bristles weakly developed; ovipositor with setulose hairs on anal plates; sternum 3 longer than greatest width; abdominal markings subtriangular, extending to ventral region of terga.

Fore tibia with no median posterior bristle; mid femur with 4 or 5 bristles on proximal half of posteroventral surface; mid tibia with 1 anterodorsal, 1 or 2 posterior, and 2 or 3 bristles on ventral surface which vary in their position from antero- to posteroventral; hind femur with 4 or 5 bristles on distal half of anteroventral surface, with no series of longish setulose bristles on posteroventral surface; hind tibia with 2 or 3 anteroventral, 2 anterodorsal, and 2 weaker posterodorsal bristles; fore tarsi with segments 2 to 4 cylindrical, normal in appearance. Wings with *R.* 4+5 and *M.* 1+2 divergent toward wing margin.

Length, 6.5 mm.

RECORDS:—

- 1 ♂, Hedley, B. C., July 3, 1923; 1 ♀, July 9, 1923; 1 ♀, July 19, 1923; 1 ♂, 1 ♀, 7000 ft. July 24, 1923; 1 ♀, Banff, Alta., July 18, 1922. (C. B. D. Garrett)

Type and allotype in the Canadian National Collection. Ottawa.

The species resembles most closely the European species *brunneisquama* Zett. Specimens have been forwarded to Mr. O. Ringdahl for identification, and he considers that the species is not *brunneisquama*, in support of which he has sent me specimens of the latter species for further comparison. I find that the males of *sectata* differ essentially from those of *brunneisquama* in the markings of the abdomen and armature of mid tibia. In the former species the terga are largely blackish, with broad expansive markings which extend laterad to ventral aspect of terga, and the mid tibia has on the ventral surface two mid ventral bristles and a more prominent bristle situated on posteroventral surface, whereas in *brunneisquama* terga three, four, and five are largely grayish pruinose with markings restricted to dorsum and more definite in outline, the mid tibia lacks the mid ventral bristles but possesses a stout bristle on posteroventral surface. The female of *sectata* has the abdominal markings more expansive than in *brunneisquama*, and the fore tibia has no median posterior bristle, whereas in the specimen of *brunneisquama* before me the fore tibia has a median posterior bristle and in addition a median ventral bristle. Both species, in common with *novæ-angliæ*, have the calyptre intensively yellowish, and in the females the mid tibia possesses a stout median ventral bristle. The species *novæ-angliæ* resembles *brunneisquama* in the markings of the abdomen, and to that extent differs from *sectata*. However in *novæ-angliæ* the hind femur possesses a series of longish fine bristles on proximal half of posteroventral surface, which series is lacking in both *sectata* and *brunneisquama*.

It is quite possible that this is the same species recorded by Stein (60) as *armipes*. His specimens were captured on Mt. Rainier, Washington.

***Limnophora (Spilogona) monacantha* Collin**

Limnophora (Spilogona) monacantha Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 271.

RECORDS:—

- 1 ♂, Umanak, Greenland, July 26, 1914; 1 ♀, July 26, 1914.
(Crocker Land Exp., M. C. T. & W. E. E.)

The species is related to those forms with one stout spine at base of ventral surface of mid femur. The male of the species may be separated from those of allied forms in that the processes of fifth abdominal sternum are highly polished at apex, and the halteres are blackish. From *semiglobosa*, which it most closely resembles, it may be further distinguished by the pale bluish gray color of the mesonotum.

***Limnophora (Spilogona) sospita* new species**

MALE, blackish; frontal vitta deep velvety black; parafacials and cheeks grayish pruinose with brownish sheen; antennae and palpi black; proboscis polished. Thorax with five broad brownish vittae on mesonotum; scutellum largely blackish, the apical area obscurely paler, pruinose. Abdomen largely brownish black on dorsum, paler on venter, opaque; tergum four with darker areas divided more or less obscurely at middle; basal sclerite of hypopygium blackish; fifth sternum slightly shining. Legs black, pulvilli brownish tinged. Wings uniformly tinged, with very little deeper infuscation basad; cross veins *r-m* and *m-cu* clouded; calyptrae slightly yellowish; halteres deep yellow.

Head with eyes separated by a distance at least equal to breadth of third antennal segment; frontal vitta prominent, entire, narrowing caudad. Parafrontal bristles continued in series caudad to nearly a level with anterior ocellus; parafrontals with a few setulae; parafacials at base of antennae equal in breadth to that of third antennal segment, but little narrowed ventrad; cheeks broad, equal in height to length of third antennal segment, the latter about one and one-third times as long as second segment; proboscis polished.

Thorax with acrosticals setulose, with four pairs of postsutural dorso-central bristles; scutellum with no setulose hairs on dorsal margin of lateral declivities; sternopleural bristles arranged in the order 1: 2.

Abdomen subcylindrical, discal and marginal bristles decidedly stouter developed than setulae; basal sclerite of hypopygium with numerous bristles; sternum 5 broadly incised, the lateral processes broadly truncated distad, with a small polished tubercular projection at apex of inner margin, the inner margin with a series of fine sparsely set hairs, remainder of fifth sternum sparsely setulose, with a few short bristles on distal half of processes.

Fore tibia with no median posterior bristle, with or without a weak median anterodorsal bristle: mid femur with 1 strong bristle at base of ventral surface, the antero- and posteroventral surfaces devoid of bristles on proximal half; mid tibia with 1 or 2 anterodorsal and 2 posterior bristles: hind femur with 3 to 5 anteroventral bristles on distal half, the posteroventral surface with no series of bristles; hind tibia with 2 to 5 anteroventral, and 2 or 3 anterodorsal bristles, and 1 or 2 setulose bristles on postero-

dorsal surface. Tarsi slender, much longer than their respective tibiae. Costa with a series of prominent setulae, those adjacent costal thorn longer than the remainder; *m-cu* cross vein erect.

FEMALE, similar to male; parafrontals with brownish infuscation adjoining the frontal vitta; thorax with pronounced deep seal-brown vittae; scutellum with brownish spots at basal angles; abdomen with broad paired brownish marks on terga 1+2, 3, and 4, which are not well defined; tergum 5 with a dorsocentral vitta; ovipositor with sclerites polished, anal plates with weak spinules.

Fore tibia with no median posterior bristle; mid femur with no bristles at base of ventral surface, antero- and posteroventral surfaces with no series of bristles; mid tibia with 2 anterodorsal and 2 posterior bristles; hind femur with a series of 4 or 5 bristles on distal half of anteroventral surface; hind tibiae with 3 anteroventral, and 2 anterodorsal bristles, and 2 setulose bristles on posterior surface.

Length, 6 mm.

RECORDS:—

8 ♂, 4 ♀, Naknek Lake, Savonoski, Alaska, June 1919; 5 ♂, 5 ♀, July, 1919. (J. S. Hine)

Type and allotype in the collection of Professor J. S. Hine, Columbus, Ohio,

Paratypes in the collection of the United State National Museum.

The species belongs to the *semiglobosa* group, which is characterized by having a stout spinelike bristle at base of ventral surface of mid femur in male. There are in all three additional species possessing this character that are reported for the first time as new to science.

This species may be separated from *semiglobosa* Ringd. and *instans* (p. 116) by the broader frons, broader parafacials, and by the possession of distinctive vittae on postsutural area of mesonotum in the male. The remaining species, *monacantha* Collin, may be readily distinguished from the others comprising the group by the black polished appearance of apex of processes of fifth sternum in the male.

Limnophora (Spilogona) instans new species

MALE, blackish; head with parafrontals and parafacials whitish pruinulent, with blackish reflections; cheeks reddish black, with light brownish pruinescence; frontal triangle and proboscis polished; frontal vitta black with whitish pruinescence; antennae and palpi black. Thorax blackish, subshining, paler on presutural area, with trace of dorsocentral vitta; scutellum

entirely black. Abdomen with bluish gray pruinescence on cephalolateral angles of terga 3, 4, and 5, terga 1+2 entirely blackish; terga 3, 4, and 5 with large black paired marks, obscurely separated owing to the infuscation on the intervening space; basal sclerite of hypopygium and sternum 5 blackish, subshining. Legs blackish, the hind legs more or less brownish black. Wings, calyptræ, and pulvilli slightly tinged, the former more densely infuscated basad; veins brownish black; halteres blackish.

Head with eyes separated by a distance about equal to diameter of anterior ocellus; parafrontals contiguous; frontal vitta small, constricted; parafrontal bristles continued in series caudad to a level with apex of frontal triangle; parafacials in profile linear, narrower than breadth of third antennal segment; cheeks well maintained caudad, in height fully equal to breadth of third antennal segment, the latter about one and three-quarter times as long as wide.

Thorax with presutural acrosticals setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen cylindrical; tergum 3 with large expansive trapezoidal marks, the inner margins of which are subparallel; tergum 4 with less expansive and more widely separated subtriangular marks, the inner margins of which diverge cephalad; tergum 5 with narrower and more obscure triangular markings; sternum 5 sparsely setulose, with a few short bristles at apex of processes.

Fore tibia with no posterior bristle: mid femur with a strong short prebasal bristle on ventral surface; mid tibia with anterodorsal bristle setulose, indistinct, with 1 or 2 posterior bristles; hind femur with 4 or 5 bristles on distal half of anteroventral surface, posteroventral surface with no series of bristles; hind tibia with 1 or 2 anteroventral, and 2 anterodorsal bristles, and with 1 or 2 weaker posterior bristles; tarsi slender, longer than their respective femora. Wings with veins *R.* 4+5 and *M.* 1+2 slightly divergent toward wing margin, *m-cu* cross vein straight.

Length, 5.5 mm.

RECORD:—

- 1 ♂, Camp 327, Alaska, Alask. Eng. Comm., July 13, 1921.
(J. M. Aldrich)

Type in the collection of the United States National Museum.

The species resembles *semiglobosa* in that in the male the parafacials in profile are reduced to lineal dimensions, the eyes are separated by a distance not greater than that between posterior ocelli, and the mesonotum is entirely black caudad of transverse suture. However in *semiglobosa* the parafrontals are very finely divided caudad by the continuation of the frontal vitta, whereas in *instans* the parafrontals are contiguous, interrupting the con-

tinuity of the frontal vitta. The abdominal marks in the male of *instans* are larger and extend to the ventral region, whereas in *semiglobosa* the abdominal marks are of moderate size and are confined to the dorsum.

The type of *instans* together with specimens of *sospita* were submitted to Mr. Ringdahl for comparative study.

***Limnophora (Spilogona) semiglobosa* Ringdahl**

Limnophora semiglobosa Ringdahl, Ent. Tidskr., 1916 XXXVII p. 238.— Ringdahl, Ent. Tidskr., 1918 XXXIX pp. 170.183.— Ringdahl, Tromsø Museums Årshefter, 1928 (1926) XLIX No. 3 p. 30.

Limnophora (Spilogona) semiglobosa Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 275.

The species has been doubtfully identified by Mr. J. E. Collin from one female as occurring in East Greenland. The only example of the species that I have seen is a male specimen from Mt. Washington, New Hampshire, in the collection of the Boston Society of Natural History which is labelled in Malloch's handwriting *Limnophora semiglobosa* Ringd. My notes of the specimen reveal certain discrepancies between them and the description of *semiglobosa* by Ringdahl which lessens my confidence in the retention of this species as occurring in North America. The thorax of the Mt. Washington specimen is described as densely grayish white pollinose with traces of three vittæ, median and sublaterals, and the fore tibia has a median posterior bristle, whereas in *semiglobosa* the thorax is described as black, and the fore tibia has no median posterior bristle.

***Limnophora (Spilogona) setilamellata* new species**

MALE, head with parafacials and parafrontals silvery pruinulent; cheeks whitish pruinulent with dark reflections; frontal triangle polished, frontal vitta viewed from below whitish pollinose; proboscis shining; antennæ and palpi black. Thorax blackish, subshining, with trace of pruinescence, with three narrow vittæ, scutellum blackish. Abdomen whitish pollinose, with terga 1+2 largely black, terga 3 and 4 with large black markings, tergum 5 with dark reflections; basal sclerite of hypopygium subshining, blackish. Legs blackish; pulvilli tinged. Wings clear, veins light brown; calyptre whitish; halteres blackened.

Head with eyes separated by a distance about equal to that between posterior ocelli; frontal vitta constricted by the contiguity of parafrontals;

parafrontal bristles continued in series caudad to a level with narrowest distance between the eyes; parafacials at base of antennæ scarcely equal to breadth of third antennal segment; cheeks narrowed throughout the caudal half by the gradual curvature of ventral margin of head, the buccal area pronounced, the vibrissal angle extending cephalad to a level with base of antennæ; antennæ short, third segment but little longer than second, arista almost bare.

Thorax with two closely adjacent series of four or five pairs of fine setulose acrosticals, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1.

Abdomen stoutly developed, cylindric-conical; tergum 3 with black trapezoidal marks, tergum 4 with smaller marks which are more constricted cephalad; abdominal sterna gradually increasing in breadth caudad, sterna 3 and 4 broader than long; sternum 5 deeply incised, the processes armed with a dense matt of black spinules on inner surface, the inner margin with a dense series of fine setulæ on apical half.

Fore tibia with a fine median posterior bristle: mid femur with a series of short erect bristles on proximal half and with a series of longish appressed setulæ on distal half of anteroventral surface, with a series of bristles on proximal two-thirds of posteroventral surface; mid tibia with 1 anterodorsal, and 2 posterior bristles: hind femur with 4 bristles on distal half of anteroventral surface, and with a series of distinctive bristly hairs on proximal half of anteroventral surface and posteroventral surface, the latter series with bristly hairs scarcely longer than apical setulæ; hind tibia with 1 or 2 anteroventral, and 3 anterodorsal bristles, the posterodorsal surface with 1 or 2 setulose bristles. Wings with veins *R.* 4 + 5 and *M.* 1 + 2 slightly divergent towards wing margin; *m-cu* cross vein slightly sinuate.

FEMALE, similar to male, abdomen subshining, with trace of grayish pruinescence, markings on terga 3 and 4 expansive, subtriangular; tergum 5 with a dorsocentral vitta; halteres blackened.

Parafrontals with a few setulæ; ovipositor with fine setulæ on anal plates. Fore tibia with 2 posterior bristles: mid legs missing: hind femur with a series of bristles on anteroventral surface, with a series of bristly hairs on proximal half of antero- and posteroventral surfaces; hind tibia with 1 anteroventral, and 3 anterodorsal bristles, the posterodorsal surface with 2 setulose bristles.

Length, 5 mm.

RECORD:—

1 ♂, 1 ♀, White Mts., New Hampshire. (Morrison)

Type and allotype in the collection of the United States National Museum.

The male of the above species may be readily differentiated from allied forms by the peculiar armature of processes of fifth

abdominal sternum. In the female specimen the halteres are blackened, the frontal vitta is black with whitish pruinescence, the anal plates of ovipositor are clothed with setulæ.

***Limnophora (Spilogona) tendipes* Malloch**

Limnophora tendipes Malloch, Ohio Journ. Sci., 1920 XX No. 7 p. 269.

RECORD:—

1 ♂, Cordova, Alaska. (J. S. Hine)

The species is only known to me by the male type cited above. It is readily recognized owing to its unique appearance. The head is about as long as high, having the face prominently inflated as in the genus *Hammomyia*. The oral margin is protruded beyond a level with base of antennæ, the latter are small and conspicuously separated at base by a large silvery facial elevation; the eyes possess a few hairs and are broadly separated; the frons whitish pruinose, and the parafrontal bristles weakly developed; the palpi and proboscis are elongated and narrow, the former flattened, spatulate; the thorax is bluish gray pruinose, with numerous setulæ and relatively short macrochaetæ; the scutellum is setulose, with numerous setulæ at base of lateral declivities and a few setulæ apicad adjacent the apical bristles; the mesopleural series of bristles possesses numerous accessory bristles dorsad; the abdomen is flattened, compressed dorso-ventrad, with a conspicuous dense series of curling bristles on basal sclerite of hypopygium; the abdominal markings appear "faded," with trace of darker markings on terga three and four, between which lies a dorsocentral vitta; the hind metatarsus has a basal spine on ventral surface.

***Limnophora (Spilogona) almquistii* (Holmgren)**

Aricia almquistii Holmgren, Nov. Spec. Ins., 1881 p. 17.—Holmgren, Ent. Tidskr., 1883 IV p. 167.

Limnophora almquistii Stein, Wien Ent. Zeitg., 1902 XXI p. 56.

Limnophora angulata Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 151.—Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 203.

Limnophora rostrata Ringdahl, Ent. Tidskr., 1920 XLI p. 26.

Melanochelia angulata Malloch, Canad. Ent., 1921 LIII p. 63.—

Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 204.

Limnophora (Spilogona) almquisti Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 259.

The species is known only to occur in Greenland on the North American continent. The synonymy I have accepted from Collin (6a), who has examined the male and female paratypes of *angulata*. I give herewith a fuller description of the type and allotype of *angulata* than that of the original.

Male: a robust species with numerous fine setulæ and bristles. Eyes with a few hairs, separated by a distance equal to diameter of anterior ocellus; parafrontals contiguous, linear, parafrontal bristles fine, continued in series caudad to a level with anterior ocellus; parafacials narrow, at base of antennæ narrower than breadth of third antennal segment; antennæ small, separated at base by a large bulbous swelling of the face; proboscis polished; vibrissal angle protruded slightly beyond a level with base of antennæ; cheeks invaded by a dense clothing of fine setulæ, notably on the buccal area.

Thorax blackish; mesonotum with five dark vittæ distinctly outlined, with four pairs of postsutural dorsocentral bristles; scutellum with a series of fine setulæ on dorsal margin of lateral declivities adjacent apical bristles; mesopleural series of bristles with an intermediate predorsal bristle; sternopleural bristles arranged 1:1. Halteres with knobs blackened; calyptre whitish, the lower scale pointed. Wings clear, slightly infuscated basad.

Abdomen robust, shining, deep brownish black with very little trace of markings, viewed from behind with trace of grayish pruinescence at cephalolateral angles of terga: sternum one with 1 or 2 setulæ, processes of fifth sternum with numerous fine longish setæ on inner border.

Fore tibia with 1 or 2 fine longish bristles on posterior surface: mid femur with a series of fine long bristles on proximal half of anteroventral surface, and throughout the posteroventral surface; mid tibia with 1 anterodorsal, and 3 longish posterior bristles, and 1 or 2 short posteroventral bristles: hind femur with an entire series of long anteroventral bristles, the posteroventral

surface with much finer bristles on proximal half; hind tibia with 4 anteroventral, 3 anterodorsal, and 2 weaker posterior bristles.

Female: head with frontal vitta opaque black with a long narrow brownish frontal triangle; parafrontals entirely brownish infuscated, each equal to about half width of frontal vitta, with numerous setulæ and in addition with a series of fine setulose bristles mesad of parafrontal bristles along the margin of frontal vitta; parafacials and cheeks broad, wider and higher respectively than breadth of third antennal segment, with grayish pruinescence, the cheeks with a darkened rectangular reflective area at cephaloventral angle of eye and with a dense series of short fine setulæ along the ventral border. Eyes smallish; second antennal segment short; arista bare, thickened proximad; palpi as long as height of eye. Mesonotum blackish, with trace of vittæ, humeral and notopleural callosities of a contrasting paler grayish color, otherwise as in male; halteres black. Abdomen subshining, with trace of darker expansive markings on terga 3 and 4; anal plates of ovipositor with fine setulæ.

Fore tibia with two posterior bristles: mid femur with a series of fine bristles on antero- and posteroventral surfaces; mid tibia with 2 anterodorsal and 2 posterodorsal and 1 posterior bristle: hind femur with an entire series of anteroventral bristles and a series of finer bristles on proximal half of posteroventral surface; hind tibia with 3 or 4 anteroventral, 3 or 4 anterodorsal bristles, and 1 or 2 setulose bristles on posterior surface. Length, 7 mm.

***Limnophora (Spilogona) sanctipauli* (Malloch)**

Limnophora triangulifera Lundbeck not Zetterstedt, Vidensk.

Medd. Naturh. Foren. Kjöbenhavn, 1898 I p. 312.

Limnophora megastoma Frey not Boheman, Mem. Acad. Sci. Russ., 1915 XXIX p. 27.

Melanochelia sanctipauli Malloch, Proc. Calif. Acad. Sci., 1921 ser. 4 XI p. 180.—Malloch, N. A. Fauna No. 46, Bur. Biol. Surv., U. S. Dept. Agric., 1923 p. 191.

Limnophora (Spilogona) sanctipauli Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 274.—Collin, Ann. Mag. Nat. Hist., 1931 ser. 10 VII p. 83.?

RECORDS:—

Alaska, 2 ♀, St. Paul Island, July 12, 1920. (G. D. Hanna)

1 ♂, 1 ♀, Point Barrow, July 13, 1882. (John Murdock)

North West Territories, 1 ♀, Pond Inlet, Sept. 6, 1925. (R.

Finnie) 1 ♀, Hersettell Isl., July 29, 1916. (F. Johansen, Canad. Arct. Exped.)

Baffin Land, 1 ♂, Nettilling Lake, July 22, 1925; 1 ♂, 1 ♀, July 9, 1925. (J. D. Soper)

Greenland, 2 ♂, 1 ♀, Cape Hatherton, N. of Etah, Aug. 13, 1925. (McMillan Exp.)

The species was described from St. Paul Island, Alaska. It is evidently a common and widely distributed species in the Arctic regions of North America. One of the paratypes of *pearyi* Malloch is undoubtedly a specimen of *sanctipauli*. Through the kindness of Dr. E. P. Van Duzee I have been able to examine the female paratypes of *sanctipauli* which agree in every important respect with the above females from Baffin Land and Greenland. One of the paratypes has three pairs of postsutural dorsocentral bristles, and the other four pairs, the number that is considered normal. The species has light grayish pruinescence with five well marked vittæ on mesonotum, the median three being broad and extended onto the presutural area, the lateral vittæ terminate at the transverse suture and are not so distinctive. In these respects the species differs markedly from allied forms, such as *almquistii*, *tristiola*, and *extensa*, in which the thorax is largely blackish, thus obscuring any trace of vittæ on the postsutural area of mesonotum. The abdomen has two pairs of conspicuous blackish subtriangular marks on a grayish background as in *tristiola*, but the wings are not so markedly hyaline as in that species. The cerci in the male are elongated and are conspicuously glossy and polished, extending distad as a single fused lamella. In the female the halteres are blackish, the parafrontals are grayish pruinose with brownish infuscation along the border adjacent the frontal vitta, and the hind femur has an entire series of anteroventral bristles.

Limnophora (*Spilogona*) *tristiola* (Zetterstedt)

Anthomyza tristiola Zetterstedt, Ins. Lapp., 1838, p. 675.

Anthomyza triangulifera Zetterstedt, Ins. Lapp., 1838, p. 680.

Aricia triangulifera Zetterstedt, Dipt. Scand., 1845 IV p. 1467.—Staeger, Kröjers Naturh. Tidsskr., 1845 ser. 2 I p. 364.—Zetterstedt, Dipt. Scand., 1860, XIV p. 6219.

Aricia vitticollis Zetterstedt, Dipt. Scand., 1845 IV p. 1471.

Aricia tristiola Zetterstedt, Dipt. Scand., 1845 IV p. 1499.

Limnophora triangulifera Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 167.—Hagen, Canad. Ent., 1881 XIII No. 1 p. 47.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 547.—Stein, Katalog Paläark. Dipt., 1907 III p. 675.—Stein, Arch. f. Naturgesch., 1914 (1913) Abt. A Heft 8 p. 28.—Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 111.—Ringdahl, Ent. Tidskr., 1918 XXXIX pp. 159. 166. 180.—Collin, Ann. Mag. Nat. Hist., 1923 ser. 9 XI p. 118.—Ringdahl, Tromsö Museums Ärshefter, 1928 (1926) XLIX No. 3 p. 30.

Limnophora tristiola Stein, Katalog Paläark. Dipt., 1907 III p. 675.

Limnophora vitticollis Stein, Katalog Paläark. Dipt., 1907 III p. 676.

Limnophora (Spilogona) triangulifera Schnabl and Dziedziicki, Abh. d. Kaiserl. Leop.—Carol. Deutsch. Akadem. d. Naturforsch., 1911 XCV Nr. 2 p. 154.

I am very doubtful whether this species should be cited as occurring in North America, the more so since Collin (6a) in examining Lundbeck's material has assigned those specimens to *sanctipauli* Malloch. Undoubtedly Stein (56) based his Greenland records on the same material. In 1878 Osten Sacken (36) recorded the species in his catalogue of North American diptera, from specimens submitted to Meade for identification. The specimens on which a study of the species has been based were collected by Mr. Ringdahl in Sweden.

The species very closely resembles *alberta* (p. 143), both having hairs on eyes, though only a few in *tristiola*, the thorax is deep black, the wings strikingly hyaline, the calyptrae white, and the abdomen with two pairs of conspicuous black marks. However in *tristiola* the oral margin is protruded beyond a level with base of antennae whilst in *alberta* the oral margin does not extend beyond a level with base of antennae. In the female, *tris-*

tiola has a long fine posterior bristle on fore tibia which is lacking in *alberta*.

Limnophora (Spilogona) megastoma (Boheman)

Aricia megastoma Boheman, Öfversigt Kaiserl. Vetens. Akadem. Förhandling., 1865 XXII p. 572.—Holmgren, Kaiserl. Svensk. Vetens. Akadem. Handlung., 1869 VIII No. 5 p. 29.

Aricia triangulifera Boheman not Zetterstedt, Öfversigt Kaiserl. Vetens. Akadem. Förhandling., 1865 XXII p. 572.

Aricia ludibunda Holmgren, Kaiserl. Svensk. Vetens. Akadem. Handlung., 1869 VIII No. 5 p. 32.

Aricia pauxilla Holmgren, Kaiserl. Svensk. Vetens. Akadem. Handlung., 1869 VIII No. 5 p. 32.—Holmgren, Öfversigt Kaiserl. Vetens. Akadem. Förhandling., 1873 (1872) XXIX No. 6 p. 101.—Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 164.

Limnophora arctica Becher not Zetterstedt, Österreichische Polarstation Jan Mayen: Insekten, 1886.

Limnophora ludibunda Stein, Wien Ent. Zeitg., 1902, XXI p. 59.

Limnophora pauxilla Stein, Wien Ent. Zeitg., 1902 XXI p. 61.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 547.—Stein, Katalog Paläark. Dipt., 1907 III p. 673.—Collin, Ann. Mag. Nat. Hist., 1923 ser. 9 XI p. 118.

Limnophora megastoma Stein, Wien Ent. Zeitg., 1902 XXI p. 64.—Stein, Katalog Paläark. Dipt., 1907 III p. 672.—Ringdahl, Ent. Tidskr., 1918 XXXIX Haft 2 pp. 167. 180.—Collin, Ann. Mag. Nat. Hist., 1923 ser. 9 XI p. 119.—Collin, Ann. Mag. Nat. Hist., 1924 ser. 9 XIV p. 201.

Limnophora dorsata Ringdahl, in part, Ent. Tidskr., 1918 XXXIX Haft 2 pp. 159. 167.

Limnophora (Spilogona) megastoma Collin, Ann. Mag. Nat. Hist., 1924 ser. 9 XIV p. 204.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 268.

This species has been recognized by Mr. J. E. Collin as occurring on the eastern littoral of Greenland. I have before me two specimens from Sweden, kindly furnished by Mr. O. Ringdahl, which form the basis of the present study of the species.

The species belongs to that group having normally four pairs of postsutural dorsocentral bristles, the halteres blackish or brownish, the oral margin protruded, and the mid tibia with no median ventral bristle. Evidently there are occasions when a series of specimens may exhibit only three pairs of strong postsutural dorsocentral bristles as indicated by Collin (6).

The species is related to *tristiola* and *extensa* in that the mesonotum is largely blackish infuscated with no definite vittae. The male of *megastoma* differs essentially from that of *tristiola* in that the pleura of thorax are not entirely intensively blackened, but exhibit a trace of grayish pruinescence: from the male of *extensa* the species may be distinguished by the longer bristles on proximal half of posteroventral surface of hind femur, and by the wider separation of the eyes. In the female of *megastoma* the scutellum is grayish pruinose mesad with black marks laterad, whereas in *tristiola* and *extensa* the scutellum is entirely blackish with trace of brownish pruinescence.

Limnophora (Spilogona) extensa Malloch

Limnophora extensa Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 150.—Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI Art. 4 p. 203.

Melanochelia extensa Malloch, Canad. Ent., 1921 LIII p. 63.

Limnophora (Spilogona) extensa Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 264.

The species is described from Greenland, specimens of which have been seen in the collections of the American Entomological Society and of the Illinois Natural History Survey. The series in the former collection consists of two species, in my opinion, namely, the male type and three female paratypes are *extensa*, whilst the remaining three female paratypes are *sanctipauli*. As indicated in the keys the species runs very closely with *tristiola* and *megastoma*. The following descriptive notes were made of the type and allotype.

Male: eyes nearly contiguous, separated by a distance equal to diameter of anterior ocellus; parafrontals contiguous, linear; parafrontal bristles finely developed, continued in series caudad to a level with anterior ocellus; cheeks narrow, elongate, con-

stricted caudad by the gradual upward curvature of caudoven-tral margin of head capsule, vibrissal area strongly protruded. Parafacials at base of antennae equal in breadth to that of third antennal segment; antennae separated at base by a rounded facial prominence, third antennal segment barely longer than second; arista nearly bare, thickened basad; proboscis polished.

Thorax blackish with trace of brownish pruinescence, pre-sutural area with grayish pruinescence and trace of median vitta; scutellum entirely black, subshining; halteres black; wings hyaline; calyptrae white.

Abdomen cylindrico-conical, with grayish pruinescence, and paired black markings on terga 3 and 4; fifth abdominal sternum broadly incised, with a group of fine bristles at apices.

Legs with long fine bristles and setulae; fore tibia with no median bristles on posterior surface: mid femur with a series of fine bristles on antero- and posteroventral surfaces; mid tibia with 1 or 2 posterior bristles: hind legs missing.

Female with brownish pruinescence on parafrontals, para-facials and cheeks; eyes nearly bare; vibrissal angle prominently protruded cephalad; thorax with brownish infuscation on meso-notum; darker on the discal area than laterad, no vittae apparent; halteres black; calyptrae white. Abdomen entirely brownish black, shining, with no definite markings, and with numerous fine longish bristles; ovipositor with fine setulae on anal plates.

Fore tibia with a median posterior bristle: mid tibia with 1 anterodorsal and 2 posterior bristles: hind femur with fine longish bristles on distal two-thirds of anteroventral surface, and on proximal half of posteroventral surface; hind tibia with fine short bristles, 2 or 3 anteroventral, 1 strong (proximal) and 1 shorter and weaker (distal) anterodorsal bristle, and with 2 setu-lose bristles on posterior surface.

***Limnophora (Spilogona) fatima* new species**

MALE, head with parafrontals, parafacials, and cheeks whitish pruin-escient with reddish to blackish reflections; frontal triangle pruin-escient; antennae and palpi blackish; proboscis polished, shining; thorax blackish, subshining, with trace of presutural pruinescence on mesonotum, with three darker, more or less obscure vittae; scutellum blackish: abdomen with dense whitish pruinescence, with paired blackish markings on terga 1+2, 3, and 4, and occasionally on the fifth tergum, with an interrupted dorsocentral vitta on

all terga, with macrochaetæ set in blackish spots; basal sclerite of hypopygium blackish, subshining, with trace of pruinescence: legs black, pulvilli tinged; wings clear, veins brownish black; calyptre whitish; halteres blackened.

Head with eyes nearly twice as high as long, separated by a distance equal to that between posterior ocelli; parafrontals contiguous, frontal vitta restricted; parafrontal bristles continued in series caudad to a level with apex of frontal triangle; parafacials at base of antennæ not prominent, variable in breadth; cheeks slightly higher than breadth of third antennal segment, markedly restricted caudad by the upward curvature of caudoventral margin of head capsule, buccal area prominent; arista nearly bare.

Thorax with two closely adjacent series of irregularly paired acrostical bristles, the presutural bristles of which are stronger developed than the adjacent setulæ; with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1: 1.

Abdomen ovate, stoutly developed; tergal markings successively smaller and more widely separated caudad; terga 1+2 largely blackish, the darker areas divided at middle; terga 3 and 4 with markings subtriangular; sternum 5 deeply emarginate, with longish setulæ.

Fore tibia with 1 median posterior bristle: mid femur with a series of short bristles or proximal half of anteroventral surface, with a series of bristles on proximal half of posteroventral surface; mid tibia with 1 or 2 anterodorsal, 2 posterior bristles: hind femur with a series of bristles on entire length of anteroventral surface, with a series of bristles on proximal half of posteroventral surface; hind tibia with 2 or 3 anteroventral, and 2 or 3 anterodorsal bristles, the distal bristle of which is stouter developed than the remaining bristles of series, and with 2 or 3 setulose bristles on posterodorsal surface.

Wing with *m-cu* cross vein straight, with veins *R.* 4+5 and *M.* 1+2 divergent toward margin of wing.

FEMALE, paler in color than male; head, thorax, and abdomen largely pale grayish pruinescent, opaque; frontal triangle whitish gray pruinescent: thorax with three brownish vittae; scutellum with brownish lateral areas at basal angles: abdomen with paired brownish marks on terga 1+2, 3, and 4, with a dorsocentral vitta on all terga; abdominal setæ set in brownish spots. Legs grayish black. Wings with *r-m* and *m-cu* cross veins slightly clouded; halteres at least tinged with black.

Head with setulæ on parafrontals; parafacials at base of antennæ at least as wide as breadth of third antennal segment, narrowed ventrad: eyes about one and a half times as high as long: sternopleural bristles arranged 1: 2. Abdominal marks ill defined; ovipositor with fine setulæ on anal plates.

Femora comparatively short and stoutly developed: tibial bristles strongly developed. Fore tibia with a strong apical posteroventral bristle, and with a median posterior bristle: mid femur with a series of bristles on proximal

half of antero- and posteroventral surfaces; mid tibia with 2 anterodorsal, and 2 or 3 posterior bristles; hind femur with a complete series of anteroventral bristles and a series of bristles on proximal half of posteroventral surface; hind tibia with 2 or 3 anteroventral, and 2 anterodorsal bristles, the distal bristle of which is more strongly developed than the proximal bristle, and with 2 or 3 setulose bristles on posterodorsal surface. Length, 4.5-5.5 mm.

RECORDS:—

Quebec, 5 ♂, 1 ♀, Lake Is., June 28, 1929; 1 ♂, Wolf Bay, June 25, 1929; 1 ♂, 2 ♀, Harrington Harbor, June 30, 1929; 1 ♀, July 2, 1929; 1 ♂, 1 ♀, July 3, 1929; 1 ♂, 1 ♀, July 4, 1929, 2 ♂, 2 ♀, Little Mecatina Is., July 6, 1929; 2 ♀, Mutton Bay, July 11, 1929; 1 ♀, Bonne Esperance, July 14, 1929; 1 ♂, 1 ♀, Thunder River, June 11, 1929. (W. J. Brown)

Ontario, 1 ♂, 1 ♀, Mer Bleue, Ottawa, May 28, 1927 (W. J. Brown); 2 ♀, June 2, 1927 (F. P. Ide); 1 ♀, July 7, 1923; 1 ♀, Ottawa, June 2, 1927. (C. H. Curran)

New York, 2 ♂, Maclean Bogs, Maclean, May 7, 1922; 1 ♀, MacLean, July 2-3, 1904.

Manitoba, 1 ♀, Aweme, May 5, 1925. (N. Criddle)

Type and allotype in the Canadian National Collection.

Paratypes in the United States National Museum.

This species is readily distinguished from its closest allied forms on account of its well defined appearance. It is a small, plump, pale gray form with deeply colored, blotchy marks on the abdomen. In both sexes there is a dorsocentral vitta between the paired abdominal marks. In many specimens there are three pairs of presutural dorsocentral bristles and three bristles on each humeral callosity, whilst in other specimens these characters show a high degree of variation. The species runs close to *tetrachaeta* in the key in that the presutural acrosticals are more stoutly developed than the adjacent thoracic setulae; the bristles on the anterodorsal surface of hind tibia are not equal in size, the distal bristle of series being stouter developed than remainder; the halteres are blackened; and the abdomen has a dorsocentral vitta. The two species are however notably different in general appearance, chiefly because of the character of the pruinescence covering the body, and of the extent of the abdomi-

nal marks. In *tetrachaeta* the body pruinescence is cinereous to brownish, and the abdominal marks are ill defined and restricted.

***Limnophora (Spilogona) tetrachaeta* Malloch**

Limnophora tetrachaeta Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 153.

Melanochelia tetrachaeta Malloch, Canad. Ent., 1921 LIII p. 62.

Spilogona tetrachaeta Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII, 1925 p. 229.

RECORDS:—

Montana, 3 ♂, 1 ♀, Bozeman, July 23, 1915; 1 ♀, Lima, July 1, 1913, (Mont. Exp. Sta.)

Alberta, 1 ♂, 2 ♀, Lethbridge, June 26, 1923; 1 ♂, 1 ♀, June 27, 1923. (H. L. Seamans) 1 ♂, Lethbridge, June 26, 1923, on clover blossom. (Walter Carter)

After examining the type of *tetrachaeta* in the collection of the Illinois State Natural History Survey it is evident that the species recorded in the New York State list of insects (21) as *tetrachaeta* is *fatima*. So far as I know *tetrachaeta* is western in its distribution. In both species the bristling of the tibiae is abnormally strong for this genus. The fore tibia has a distinctive median anterodorsal bristle and a stoutly developed apical posteroventral bristle; the mid and hind tibiae have strong bristles on the anterodorsal surface, in the case of the hind tibia the distal bristle of anterodorsal series is stouter developed than the remaining bristles in the same series. In the males of *tetrachaeta* the eyes are separated at narrowest by a distance fully equal to breadth of third antennal segment, the parafrontals are separated throughout by the frontal vitta, whereas in *fatima* the eyes are separated at narrowest by a distance not equal to breadth of third antennal segment, and the parafrontals are contiguous caudad interrupting the frontal vitta. In the females of *tetrachaeta* the scutellum is entirely cinerous pollinose, and the cross vein *m-cu* normally clear, whereas in *fatima* the scutellum has blackish spots at basal angles, and the cross vein *m-cu* is clouded.

***Limnophora (Spilogona) concolor* Stein**

Limnophora concolor Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 46, 55.

RECORDS:—

North West Territories, 1 ♂, 2 ♀, Nyarling River, July 4, 1926;

1 ♂, 1 ♀, July 11, 1926. (J. Russell)

Alberta, 1 ♀, Banff, Aug. 18, 1922; 1 ♂, 2 ♀, Aug. 21, 1922. (C.

B. D. Garrett): 1 ♀, 1 ♂, Jasper, July 25, 1926. (J. McDunnough)

Manitoba, 1 ♂, Winnipegosis, July 13, 1926. (E. Criddle)

Wyoming, 1 ♂, 5 ♀, U. Geyser Basin, Yellowstone Park, Aug.

7, 1918. (A. L. Melander)

There are five species before me which are evidently representative of a group in this subgenus having the head very broad when viewed from in front, much broader than high; the oral margin not protruded beyond base of antennæ; scutellum with appressed setulose hairs on dorsum of lateral declivities adjacent apical bristles, and in the female with the anal plates of ovipositor armed with spinules. Such species are *leucogaster* Zett., *concolor* Stein, *obscuripennis* Stein, *aerea* Zett., and *addicta* (p. 133).

The male of *concolor* is readily distinguished from those of allied species in that the calyptrae are intensively browned, and the halteres blackened. The males of *anthrax* and *narina* have the calyptrae intensively infuscated also, but the halteres are yellow in the former species and the eyes are much more widely separated in the latter species. In addition the scutellum of both species has no appressed hairs on dorsal margin of lateral declivities adjacent apical bristles. The female of *concolor* has the halteres blackened and the abdomen shining with very little trace of pruinescence, in coloration very similar to the female of *Hebecnema vespertina* Fallen. In addition the frontal triangle is polished as in *aerea*, but the latter has yellowish to brownish halteres and the abdomen has distinctive brownish pruinescence when viewed from behind. I have not seen the female of *leucogaster* but, in my opinion, the female of *concolor* probably closely resembles that of *leucogaster*.

Limnophora (Spilogona) leucogaster (Zetterstedt)

Anthomyza leucogaster Zetterstedt, Ins. Lapponica, 1838, p. 674.

Aricia leucogaster Zetterstedt, Dipt. Scand., 1845 IV p. 1497.—

Zetterstedt, Dipt. Scand., 1860 XIV p. 6227.

Limnophora leucogaster Stein, Katalog Paläark. Dipt., 1907 III p. 671.—Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 102.—Ringdahl, Ent. Tidskr., 1918 XXXIX p. 159.—Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 47, 56.

RECORDS:—

1 ♂, Katmai, Alaska, June 1917. (J. S. Hine): 1 ♂, Healy, Alaska, June 26, 1921. (J. M. Aldrich)

The male of this little known European species superficially resembles those of the genus *Sphenomyia*, differing essentially in that the vein *R*. 4 + 5 has no setulæ on under surface of basal section. The species was recorded by Stein (60) from Mt. Rainier, Washington, and in my opinion, if Stein's identification is correct, it is more than probable that *nitidifrons* Stein (60) is the female of the same species. I am, however, doubtful whether the specimens that Stein had before him were *leucogaster*. They may have been *Sphenomyia biquadrata* Walker, a species which has been taken by Garrett and Seamans at Banff and Oliver in the Canadian Rockies.

Another species which has the abdomen silvery pruinose in the male is *argentiventris* Malloch. The male of this species differs from that of *leucogaster* in having the halteres yellow, the hind femur with a few short bristles on proximal half of posteroventral surface, and the scutellum with no setulose hairs on dorsal margin of lateral declivities adjacent apical bristles.

Limnophora (*Spilogona*) *obscuripennis* Stein

Limnophora obscuripennis Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 93.—Ringdahl, Tromsø Museums Årshefter, 1928 (1926) XLIX No. 3 p. 29.

RECORDS:—

Alaska, 3 ♂, 2 ♀, Naknek Lake, Savonoski, June 1919; 1 ♀, July 1919; 1 ♂, 1 ♀, July 27, 1919; 2 ♂, July 28, 1919. (J. S. Hine)

Colorado, 1 ♂, Tenn. Pass, July 23, 1917; 1 ♀, 1024 ft., July 10—(J. M. Aldrich)

The species most closely resembles *aerea* and *addicta* (p. 133), from which it may be separated in both sexes by the possession of a series of short bristles on proximal half of posteroventral

surface of hind femur. In the female of *obscuripennis* and *addicta* the frontal triangle and proboscis are pollinose, not polished as in *aerea*.

***Limnophora (Spilogona) addicta* new species**

MALE, blackish; parafrontals, parafacials, and cheeks whitish pruinose; frontal triangle polished; proboscis lightly pollinose, subshining; abdomen with dense grayish pruinescence, terga 3 and 4 with blackish marks when viewed from behind. Wings smoky, but little darkened basad. Calyptæ infuscated; halteres blackened, sometimes brownish. Pulvilli whitish.

Head with eyes separated by a distance not greater than that between posterior ocelli, parafrontals contiguous cephalad of anterior ocellus; frontal vitta gradually broadened cephalad. Parafacials, in profile, receding ventrad, at base of antennæ slightly protruding beyond a level with vibrissæ; cheeks with a prominent series of upcurved bristles. Thorax with an intermediate predorsal bristle in marginal series on mesopleura. Abdomen with a pair of large subquadrate marks on tergum 3, with a pair of smaller, more widely separated subtriangular marks on tergum 4, tergum 5 unmarked; basal sclerite of hypopygium lightly pollinose, faintly subshining.

Fore tibia with no median posterior bristle; mid femur with a series of longish bristles on proximal half of posteroventral surface; mid tibia with 2 median posterior bristles; hind femur with 4 or 5 bristles on distal half of anteroventral surface, posteroventral surface with no series of short bristles on proximal half; hind tibia with 2 to 4 anteroventral, and 2 or 3 anterodorsal bristles, the posterior surface with or without weak setulose bristles.

FEMALE, similar to male; parafrontals brownish infuscated; parafacials and cheeks paler; frontal triangle pollinose. Thorax grayish black, the mesonotum and scutellum largely more or less brownish infuscated. Abdomen concolorous with thorax, subshining, with paired brownish subtriangular marks on terga 3 and 4, the markings more or less indistinct. Calyptæ yellowish tinged; halteres brownish to yellowish. Ovipositor armed with spinules on anal plates.

Fore tibia with no median posterior bristle; mid femur with 2 or 3 fine bristles on proximal third of posteroventral surface; mid tibia with or without an anterodorsal bristle, with 2 median posterior bristles; hind femur with 4 or 5 bristles on distal half of anteroventral surface, posteroventral surface with no series of short bristles; hind tibia with 2 to 4 anteroventral, 2 or 3 anterodorsal bristles, and with or without 1 or 2 setulose bristles on posterior surface. Length, 4.5-5.0 mm.

RECORDS:—

3 ♂, 2 ♀, Naknek Lake, Savonoski, Alaska, June 1919; 1 ♀, July 1919; 1 ♀, July 28, 1919; 1 ♂, Aug. 1, 1919; 1 ♀, Aug. 14, 1919. (J. S. Hine) 1 ♂, Katmai, Alaska, June 10, 1919.

(J. S. Hine) 1 ♂, 1 ♀, Anchorage, Alaska, June 13, 1921; 1 ♀, June 15, 1921. (J. M. Aldrich)

Type and allotype in the collection of Professor J. S. Hine, Columbus, O.

Paratypes in the collection of the United States National Museum.

The males of *addicta* most closely resemble those of *aerea*. The males of both species may be distinguished from those of *obscuripennis* by the lack of short bristles on proximal half of posteroventral surface of hind femur, by the possession of one or two intermediate predorsal bristles in the marginal series on mesopleura, and by the fact that the wings, if infuscated, are uniformly tinged, being little if any darker basad. The males of *addicta* and *obscuripennis* however agree and thereby differ from those of *aerea* in that the marks on tergum three are separated along the dorsocentral plane into two trapezoidal areas, whilst those on *aerea* are fused together. In addition the males of *addicta* have the halteres blackened and the abdominal terga of segments three, four, and five, with lighter pruinescence and, in contrast, more distinctly defined marks, whereas in *aerea* and *obscuripennis* the abdomen has darker pruinescence, and as a result less well defined marks.

The females of *addicta* most closely resemble those of *obscuripennis* in that the frontal triangle and proboscis are more or less pollinose, whereas in the females of *aerea* the frontal triangle and proboscis are polished. However in common with *aerea* they differ from *obscuripennis* in that the hind femur has no series of short bristles on proximal half of posteroventral surface, and the mesopleural series of bristles possesses one or two weaker intermediate predorsal bristles.

***Limnophora (Spilogona) pusilla* new species**

MALE, black; parafrontals and parafacials silvery pruinose; cheeks duller, with dark reflections; frontal triangle and proboscis polished; frontal vitta with brownish pruinescence; antennæ and palpi black. Thorax blackish, subshining; vittæ more or less obscured; pleura blackened. Abdomen slate gray pruinose with terga 1+2 entirely blackish; terga 3 and 4 well marked; tergum 5 with a more or less infuscated marking on dorsocentral plane; hypopygium and sternum 5 blackish, basal sclerite of hypopygium with trace of pruinescence, subshining. Legs blackish, pulvilli

tinged. Wings smoky, more densely infuscated basad: calyptræ tinged, the lower scale with margin markedly dark brownish infuscated. Halteres deep yellowish, with extensive purplish infuscation.

Head with eyes separated by a distance slightly greater than diameter of anterior ocellus; parafrontals contiguous; parafrontal bristles continued in series caudad to about level with apex of frontal triangle; parafacials at base of antennæ slightly narrower than breadth of third antennal segment, constricted ventrad; cheeks about as high as breadth of third antennal segment; palpi with most of the setulæ very short.

Thorax with presutural acrosticals setulose, with four pairs of post-sutural dorsocentral bristles; sternopleural bristles arranged 1:2. Scutellum with a few fine setulose hairs on dorsal margin of lateral declivities adjacent apical bristles.

Abdomen broadly subovate; tergum 3 with markings larger and more narrowly separated than those on tergum 4, trapezoidal in outline; tergum 4 with markings subtriangular, inner margins divergent cephalad; tergum 5 with markings obscure and variable; sternum 5 with a uniform covering of fine setulæ.

Fore tibia with or without a fine posterior bristle: mid femur with a series of fine bristles on proximal third of anteroventral surface, with a series of bristles on proximal two-thirds of posteroventral surface; mid tibia with or without a fine anterodorsal bristle, and 2 posterior bristles: hind femur with 4 or 5 bristles on distal half of anteroventral surface, with no setulose bristles on proximal half of posteroventral surface; hind tibia with 1 or 2 anteroventral, and 1 anterodorsal bristle, the normal weak bristles on posterior surface not evident.

Length, 4 mm.

RECORDS:—

1 ♂, Tennessee Pass, Colorado (10,240 ft.). (J. M. Aldrich)

1 ♂, Nettilling Lake, Baffin Land, July 9, 1925. (J. D. D. Soper)

Type in the United States National Museum.

The male of this species resembles that of *denudata* Holmgren. Both species possess pale grayish pruinescence on abdomen, on which the abdominal marks are clearly outlined, and both species possess two or three setulose hairs on dorsal margin of lateral declivities of scutellum adjacent the apical bristles. In the latter respect the species agrees with *aerea* and *addicta*, but from both these species it may be distinguished by the lack of a weak pre-dorsal bristle among the mesopleural series of bristles.

In the male of *pusilla* the hind tibia has only one well developed median bristle on anterodorsal surface, the lower calyptra

has the margin dark brownish infuscated, the parafacials at base of antennae slightly narrower than width of third antennal segment, the cheeks about as high as width of third antennal segment, and the hind femur has at most a few fine setulae at base of posteroventral surface, whereas in *denudata* the hind tibia has two or three anterodorsal bristles, the lower calyptra has the margin yellowish, the parafacials at base of antennae as wide as breadth of third antennal segment, the cheeks fully as high as breadth of third antennal segment, and the hind femur has a single short bristle on proximal third of posteroventral surface.

***Limnophora (Spilogona) denudata* (Holmgren)**

Aricia denudata Holmgren, Kaiserl. Svensk. Vetens. Akadem. Handlung., 1869 VIII No. 5 p. 30.—Holmgren, Öfvers. Kongl. Vetens. Akadem. Förhl., 1873 (1872) XXIX No. 6 p. 101.—Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 164.

Aricia ranunculi Holmgren, Kaiserl. Svensk. Vetens. Akadem. Handlung., 1869 VIII No. 5 p. 34.—Holmgren, Öfvers. Kongl. Vetens. Akadem. Förhl., 1873 (1872) XXIX No. 6 p. 101.—Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 III p. 164.

Limnophora contractifrons Lundbeck in part, Videns. Medd. Naturhist. Foren. Kjöbenhavn, 1898 I p. 311.

Limnophora denudata Stein, Wien Entom. Zeitg., 1902 XXI p. 57.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 547.—Stein, Katalog Paläark. Dipt., 1907 III p. 670.—Collin, Ann. Mag. Nat. Hist., 1923 ser. 9 XI p. 118.

Limnophora ranunculi Stein, Wien Entom. Zeitg., 1902 XXI p. 62.—Collin, Ann. Mag. Nat. Hist., 1924 ser. 9 XIV p. 202.

Limnophora (Spilogona) denudata Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 262.

RECORDS:—

1 ♂, 1 ♀, Nettilling Lake, Baffin Land, July 9, 1925. (J. D. Soper)

The above specimens are in poor condition, but they have been compared with other specimens from Greenland by Mr. J. E. Collin, who bases his identification largely on the structure of the male genitalia. In the male the cerci are exposed, exhibiting a relatively widely separated pair of slender styli, which

gradually converge distad. As indicated in the key to male specimens, the species most closely conforms to *pusilla*.

***Limnophora (Spilogona) aerea* (Fallen)**

Musca aerea Fallen, Dipt. Suec., Muscides, 1825 p. 76.

Anthomyza aerea Zetterstedt, Ins. Lapponica, 1838 p. 686.

Aricia rotundiventris Zetterstedt, Dipt. Scand., 1845 IV p. 1557.

Aricia aerea Zetterstedt, Dipt. Scand., 1845 IV p. 1602.

Limnophora aerea Stein, Ent. Nachr., 1892 XVIII Nos. 20-21 p. 329.—Stein, Katalog Paläark. Dipt., 1907 III p. 669.—Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 pp. 85.96.—Ringdahl, Ent. Tidskr., 1918 XXXIX pp. 168. 174.179.—Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 pp. 48.56.—Ringdahl, Tromsø Museums Ärshefter, 1928 (1926) XLIX No. 3 p. 29.

Aricia (Limnophora) aerea Pandellé, Revue entom. France, 1899 XVIII p. 127.

Limnophora (Spilogona) aerea Collin, Ent. Month. Mag., 1921 ser 3 VII pp. 172.265.—Karl, Tierwelt Deutschlands, 1928 Th. XIII p. 102.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 277, pls. 17.25.

Spilogona aerea Johnson, Occ. Papers Boston Soc. Nat. Hist., No. VII 1925 p. 229.—Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, 1927 p. 208.

RECORDS:—

Alaska, 5 ♀, 2 ♂, Popoff Islands, July 8, 1899; 3 ♂, 4 ♀, July 9, 1899; 5 ♂, 6 ♀, July 10, 1899; 3 ♂, 2 ♀, July 11, 1899; 2 ♂, July 12, 1899; 1 ♂, July 13, 1899; 1 ♂, July 14, 1899; 2 ♂, July 15, 1899; 1 ♂, July 17, 1899; 4 ♂, 3 ♀, Saldovia, July 21, 1899. (Harriman Exped. '99. T. Kincaid) 1 ♂, Anchorage, June 15, 1921; 2 ♀, June 16, 1921; 2 ♂, July 19, 1921; 1 ♀, Seward, July 21, 1921. (J. M. Aldrich)

Washington, 3 ♂, Bellingham, May 31, 1917. (H. G. Dyar) 3 ♂, Blynn, Aug. 10, 1921. (A. L. Melander)

Quebec, 2 ♂, Natashquan, Aug. 1, 1929; 1 ♂, 7 ♀, Aug. 2, 1929; 9 ♂, 7 ♀, Aug. 7, 1929. (W. J. Brown) 1 ♂, Anticosti Isle, Aug. 6, 1923. (F. Johansen)

Nova Scotia, 8 ♂, 6 ♀, Kentville, July 3, 1924. (R. P. Gorham)

The males of *aerea* are characterized by the following combination of characters, the lack of a series of short bristles on proximal half of posteroventral surface of hind femur; by the possession of one or two weak bristles situated immediately ventrad of dorsal bristle of mesopleural series (this position being devoid of accessory bristles in closely allied species); by the fact that the wings, if infuscated, are uniformly tinged, being very little if any darker basad. In these respects the species agrees with the male of *addicta*, but differs from the latter species in that the markings on tergum three are fused across the dorsum into a broad black band, and the proboscis is entirely polished. In the female of *aerea* and *addicta* the first two characters mentioned above also hold true, but the female of the former species differs from that of the latter in having the frontal triangle polished and not pollinose.

There is a great deal of variation in the coloration of halteres and calyptæ. In the males they may be yellowish or brownish, or tinged with purple or black, and the calyptæ may be whitish to yellowish.

***Limnophora (Spilogona) pulvicrura* new species**

MALE, blackish; parafrontals, parafacials, and cheeks whitish pruinose with dark, occasionally reddish, reflections; frontal vitta whitish pollinose; antennæ and palpi black; proboscis shining. Thorax blackish, opaque, with whitish pruinescence on presutural region, postsutural area and scutellum darker, with three narrow brownish vittæ and obscure markings laterad, the vittæ most distinct on presutural region; scutellum entirely black; pleura blackened. Abdomen largely blackish on dorsum, markings ill defined but apparently fused across dorsum; the cephalolateral angles of terga 3, 4, and 5 of paler pruinescence when viewed from behind; terga 1+2 entirely blackish. Legs blackish, tibiæ with grayish pruinescence. Wings clear, tinged slightly basad, veins brown. Calyptæ whitish with margins pale yellow; halteres blackened.

Eyes separated by a distance equal to length of third antennal segment; frontal vitta uniformly distinct throughout; parafrontals broad, each about equal to half breadth of frontal vitta, parafrontal bristles weak, continued in series to level with frontal triangle, with few accessory setulæ; parafacials at base of antennæ equal to breadth of third antennal segment; cheeks broad, in height equal to length of third antennal segment, ventral border of cheeks with numerous fine setulæ and bristles; third antennal segment but little longer than broad; arista short, swollen at base.

Mesonotum with numerous setulæ; acrosticals setulose; postsutural dorso-central bristles four pairs; sternopleural bristles arranged 1:1; sternopleura with a noticeable tuft of coarse bristles cephalad of coxa.

Abdomen subcylindrical, with fine bristles and setulæ on terga, marginal and discal series not well differentiated as to size; fifth sternum sparsely setulose, the setulæ becoming longer along inner margin and on apical region, with broad blunt processes, the inner margins of which are slightly attenuated at apex.

Tibial bristles fine and weakly developed. Fore tibia with or without a median posterior bristle: mid femur with a series of short bristles on proximal half of posteroventral surface; mid tibia with or without an anterodorsal bristle, with 1 or 2 posterodorsal bristles: hind femur with 4 to 7 anteroventral bristles on distal half, posteroventral surface bare; hind tibia with 2 anteroventral, and 2 or 3 anterodorsal bristles.

FEMALE, paler in color than male; head, thorax, and abdomen slate gray; head with parafrontals and ventral border of cheek more or less brownish pollinose, concolorous with ocellar triangle. Mesonotum with brownish vittæ, mesopleura brownish pollinose on dorsal border; macrochètæ of mesonotum and scutellum set in brownish spots. Abdomen with paired brownish transverse marks on caudal half of terga 1+2, 3, 4, those on terga 1+2 more or less obscure; fifth tergum unmarked. Halteres deep yellow, tinged with purple. Calyptre whitish or yellowish.

Eyes separated by a distance greater than length of antennæ; parafrontals average one-half to three-quarters as wide as frontal vitta, with numerous setulæ; parafrontal bristles comparatively weak; parafrontals and cheeks in profile broad, the former at base of antennæ and the latter ventrad of eye at least equal to length of third antennal segment. Abdomen with marginal and discal bristles of terga more distinctly differentiated than in male; ovipositor with sclerites polished and shining, anal plates with fine setulæ.

For tibia with 1 or 2 median posterior bristles: mid femur with a few sparsely set bristles on proximal half of posteroventral surface; mid tibia with or without a median anterodorsal bristle, with 2 posterior bristles: hind legs as in male.

Length, 5-6 mm.

RECORDS:—

4 ♂, 9 ♀, Naknek Lake, Savonoski, Alaska, June 1919; 4 ♂, 4 ♀, July 1919. (J. S. Hine)

Type and allotype in the collection of Professor J. S. Hine, Columbus, O.

Paratypes in collection of United States National Museum.

Three males of the above series possess one or more setulæ on the first abdominal sternum. The species superficially resembles

nobilis Stein, from which it differs essentially in both sexes in having no fine bristles on proximal third of posteroventral surface of hind femur, the ventral bristles on sternopleura are coarser and more tufted, and in the female the anal plates of ovipositor possess fine hairs and not spinules.

***Limnophora (Spilogona) carbonella* (Zetterstedt)**

Aricia carbonella Zetterstedt, Dipt. Scand., 1845 IV p. 1414.

Spilogaster carbonella Rondani, Della Soc. Ital. Scienze Naturali, 1866 IX p. 117.—Rondani, Dipt. Ital. Prodr., 1877 VI p. 102.—Stein, Entom. Nachr., 1888 XIV No. 24 p. 372.—Stein, Entom. Nachr., 1893 XIX p. 216.—Strobl, Verh. zool.-bot. Ges. Wien, 1894 (1893) XLIII p. 220.—Slosson, Ent. News, 1895 VI p. 6.—Czerny, Wien Ent. Zeitg., 1901 XX Heft I and 2 p. 37.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 544.

Spilogaster nigrinervis var *minor* Strobl, Verh. zool.-bot. Ges. Wien, 1894 (1893) XLIII p. 220.

Aricia (Spilogaster) carbonella Pandellé, Revue entom. France, 1899 XVIII p. 114.

Limnophora carbonella Stein, Katal. Paläark. Dipt., 1907 III p. 669.—Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 97.—Ringdahl, Ent. Tidskr., 1918 XXXIX No. 2 p. 161.

Limnophora (Spilogona) carbonella Schnabl and Dziedzicki, Abh. d. Kaiserl. Leop.-Carol. Deutsch. Akadem. Naturforsch., 1911 XCV Nr. 2 p. 154.—Karl, Tierwelt Deutschlands, 1928 Th. XIII p. 97.—Collin, Trans. Ent. Soc. London, 1930 LXXVIII Pt. 2 p. 279, pls. 18.22.

Spilogona carbonella Johnson, Occ. Papers Boston Soc. Nat. Hist., No. VII, 1925 p. 229.

RECORDS:—

1 ♂, Anchorage, Alaska, June 15, 1921; 1 ♂, Fairbanks, Alaska, June 30, 1921. (J. M. Aldrich)

This European species has been recognized by Coquillett (52) from material captured by Mrs. A. T. Slosson on Mount Washington, New Hampshire. It is doubtful whether these specimens are still in existence. I have before me two male specimens of this species, one from Sweden sent by Mr. Ringdahl, and another

from Strobl's collection belonging to Dr. A. L. Melander, together with the above two specimens collected by Dr. Aldrich in Alaska.

There are differences between the European and American specimens of this species which might be construed to be of specific importance, but the matter is a delicate one, and I feel reluctant to accord them full recognition with the limited series available.

In the European specimens there are three pairs of postsutural dorsocentral bristles (on one side of the Swedish specimen there are four postsutural dorsocentral bristles), and the halteres are blackish. In addition there are other differences, such as the arista, which has relatively long hairs for this genus, is not swollen at base, the parafacials and cheeks are no wider than the breadth of third antennal segment, the vibrissæ and abdominal bristles are noticeably robust, the hind femora have no distinctive setulose bristles on proximal half of anteroventral surface, differences which tend to accentuate the tendency to separate the specimens. On the other hand, in the Alaska specimens there are four pairs of postsutural dorsocentral bristles, the halteres are deep yellow with a trace of purplish, the arista is minutely pubescent and is decidedly swollen at base, and the cheeks are fully as high as width of third antennal segment, the vibrissæ and abdominal bristles are not noticeably robust, and the hind femur has a distinctive series of short setulose bristles on proximal half of anteroventral surface. In addition the first sternum of abdomen has a few setulæ, and the eyes a few hairs, such setulæ and hairs are lacking in the European specimens.

All the specimens agree in having the wings densely infuscated, the abdominal marks, hypopygium, and processes of fifth sternum of similar appearance, the third and fourth sterna with shorter setulæ than that on second and fifth sterna, and the legs, except for the variation on the anteroventral surface of hind femur already mentioned, with similar chaetotaxy.

The males of *carbonella* closely resemble those of *imitatrix* Malloch and *bisetosa*. From the former species the sexes may be distinguished by the vestiture on the processes of fifth abdominal sternum, and by the bristling on the postero-

ventral surface of hind femur. In *carbonella* the processes of fifth sternum have no dense series of setulæ at base adjacent the inner margin, and the hind femur has two or three short bristles on proximal half of posteroventral surface, whereas in *imitatrix* the processes of fifth sternum possess a dense series of appressed setulæ at base, and the posteroventral surface of hind femur is bare. In the males of *bisetosa* the hind femur has no bristles on proximal half of posteroventral surface, and the processes of fifth abdominal sternum have no dense series of appressed setulæ at base.

***Limnophora (Spilogona) nobilis* Stein**

Limnophora nobilis Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII Heft 3 and 4 p. 207.—Coquillett, Proc. Wash. Acad. Sci., 1900 II p. 445.—Stein, Ann. Mus. Nation, Hungarici, 1904 II p. 465.—Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 547.—Stein, Arch. f. Naturgesch., 1919 (1917) Abt. A Heft I p. 136.—Stein, Arch. f. Naturgesch., 1920 (1918) Abt. A Heft 9 p. 47.

Melanocheilia nobilis Malloch, Canad. Ent., 1921 LIII pp. 62.63.—Malloch, N. A. Fauna, No. 46 Bur. Biol. Surv., U. S. D. A., 1923 p. 191.

RECORDS:—

Alaska, 1 ♂, 1 ♀, Katmai, July 1917. (J. S. Hine) 1 ♂, Seward, July 24, 1921; 1 ♂, 1 ♀, July 25, 1921. (J. M. Aldrich) 1 ♂, Sitka, June 16, 1899. (Harriman Exped. '99 T. Kincaid)

Washington, 1 ♂, Walkers Park, Shelton, July 21, 1917; 1 ♀, Blynn, Aug. 10, 1921; 1 ♀, Tokeland, July 18, 1917. (A. L. Melander)

The male of this species may be distinguished from many of those with eyes separated by a broad frontal vitta by the fact that the vertical bristles of head are not strongly developed. The frontal vitta is very slightly, if at all, constricted caudad; and the parafrontals are constricted to lineal dimensions at narrowest distance between the eyes, when viewed from above. In contrast to the black thorax and halteres, the wings are entirely clear and the calyptræ white. The abdomen is characteristically

marked by large blackish trapezoidal patches on dorsum of terga three and four.

The female is much paler and more pruinose than male, though possessing the same characteristic shaped head with jet black frontal vitta. The halteres are yellowish with purplish tinge, and the anal plates of ovipositor possess short stout spines.

In both sexes the first abdominal sternum may or may not possess setulae.

It is possible that this species should be associated with the European segregate *Villeneuvea* Schnabl and Dziedzicki.

***Limnophora (Spilogona) alberta* new species**

MALE, black; head with parafacials silvery pruinose, parafrontals with trace of brownish infuscation, cheeks not so highly pruinose, all with dark reflections; frontal vitta black with trace of brownish pollen; frontal triangle polished; proboscis shining; antennae and palpi black. Thorax entirely blackened, including the pleura, subshining, with trace of brownish pruinoscence. Abdomen with bluish gray pruinoscence on cephalolateral angles of terga 3, 4, and 5; terga 1+2 entirely black, terga 3, 4, and 5 with paired black marks; hypopygium blackish, basal sclerite subshining. Legs black. Wings hyaline throughout, veins brownish. Calyptrae whitish; halteres black.

Eyes with numerous hairs, separated by a distance slightly greater than diameter of anterior ocellus, with a dense fringe of fine longish postorbital setulae; parafrontals contiguous, restricting the frontal vitta, with a dense series of fine bristles which extends caudad to a level with anterior ocellus; parafacials at base of antennae narrower than breadth of third antennal segment; cheeks at average height about equal to average breadth of third antennal segment, invaded along the ventral border by a dense series of fine upturned bristles; antennae conspicuously separated at base, third segment gradually broadened apicad, at greatest breadth slightly longer than broad; arista thickened proximad, with microscopic pubescence. Thorax with numerous fine setulae; acrosticals setulose; with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1.

Abdomen conical, with numerous fine setulae and bristles; tergum 3 with expansive, narrowly separated subtriangular marks; tergum 4 with more restricted triangular marks; tergum 5 with smaller marks, extending cephalad to margin of tergum, and becoming fused caudad; sternum 5 broadly emarginate caudad, with fine setulae and bristles.

Fore femur with a dense series of long fine bristles on posterior surface; fore tibia with no median posterior bristle, and with a weak apical postero-ventral bristle; mid femur with a dense series of fine short setulose bristles along the anteroventral surface, and a dense series of longish bristles and setulae along the ventral half of posterior surface, the bristles becoming

shorter distad; mid tibia with 1 or 2 posterior bristles: hind femur with an entire series of bristles along the anteroventral surface, those on proximal half weaker than those on distal half, posteroventral surface with a series of long fine bristles on proximal half; hind tibia with 1 anteroventral, and 1 or 2 anterodorsal bristles, with 1 or 2 obscure setulose bristles on posterior surface, with apical anterodorsal bristle setulose. Wings with costal thorns small; veins *R.* 4+5 and *M.* 1+2 gradually divergent to wing margin.

FEMALE, similar to male, largely blackish; parafacials and cheeks grayish pruinulent; parafrontals brownish infuscated; frontal vitta black, opaque; frontal triangle brownish pruinulent; proboscis subshining. Thorax, including pleura and scutellum, blackened, with paler areas adjacent humeral and notopleural callosities. Abdomen largely blackish, subshining, tergum 3 with dorsum nearly entirely black, tergum 4 with a large triangular dorsal mark, tergum 5 with a broad dorsocentral vitta, and pale grayish pruinulences. Wings hyaline: calyptæ white: halteres black.

Eyes with numerous hairs; parafacials as broad and cheeks as high as width of third antennal segment; anal plates of ovipositor with setulose hairs.

Fore tibia with no median posterior bristle: mid femur with a series of short weak bristles on proximal half of anteroventral surface, and a series of longish bristles and setulæ on proximal half of posteroventral surface; mid tibia with 1 or 2 posterior bristles: hind femur with a series of anteroventral bristles, those on proximal half weaker and shorter than those on distal half, posteroventral surface with a series of bristles on proximal half; hind tibia with 1 anteroventral, and 2 anterodorsal bristles, with apical anterodorsal bristle short and weakly developed.

Length, 5.75-6.0 mm.

RECORDS:—

- 1 ♂, Banff, Alta., July 27, 1922; 1 ♀, June 13, 1922 (5600 ft.).
(C. B. D. Garrett) 1 ♂, Banff, Alta., June 28, 1908. (N. B. Sanson)

The species closely resembles the European species *tristiola* Zett., specimens of which have been sent to me by Mr. Ringdahl after he had examined those of *alberta*.

The species differs in that the vibrissal and oral margins do not protrude cephalad beyond a level with base of antennæ, as in *tristiola*, and the eyes have more numerous hairs than in the latter species.

Type and allotype in the Canadian National Collection.

Limnophora (Spilogona) crepusculenta new species

MALE, bluish black; parafrontals, parafacials, and cheeks silvery pruinulent, with reddish black reflections; antennæ and palpi black; proboscis

lightly pollinose, subshining: mesonotum of thorax, viewed from in front and above, with bluish black pruinescence and three brownish vittæ which do not extend cephalad beyond the transverse suture; scutellum entirely blackish; thoracic pleura largely blackened, concolorous with legs: abdomen with trace of bluish black pruinescence, subshining; terga 1+2 entirely black, terga 3 and 4 with black subtriangular markings which are more or less suffused across the dorsocentral plane; tergum 5 with a dorsocentral vitta and infuscation along the caudal half of tergum; basal sclerite of hypopygium lightly pollinose; processes of fifth sternum shining on distal half. Legs black, pulvilli tinged. Wings clear, tinged basad; veins brownish: calyptræ white: halteres black.

Eyes separated by a distance about equal to diameter of anterior ocellus; parafrontals contiguous; frontal vitta restricted; parafrontal bristles finely developed, continued in series caudad to about level with narrowest distance between the eyes; parafacials at base of antennæ nearly equal to breadth of third antennal segment, but little narrowed ventral; cheeks broad, in height equal to length of third antennal segment; antennæ relatively widely interspaced, second segment three-quarters as long as third segment; arista almost bare, thickened on basal third. Thorax with presutural acrosticals setulose, sparsely set; with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:1.

Abdomen with markings on terga 3 and 4 subtriangular, expansive, those on tergum 4 smaller than those on tergum 3; the paired nature of the markings more or less obscured owing to heavy infuscation covering the interspaces; basal sclerite of hypopygium with numerous fine bristles; fifth sternum deeply emarginate, with a few fine setulæ.

Fore tibia with no median posterior bristle, with a fine apical posteroventral bristle: mid femur with a series of short fine bristles on proximal third of anteroventral surface, and with a series of bristles on proximal two-thirds of posteroventral surface; mid tibia with 2 posterior bristles: hind femur with a complete series of anteroventral bristles, and a series of fine long bristles on proximal half of posteroventral surface; hind tibia with 2 anteroventral, and 2 anterodorsal bristles, the posterior weak bristles not evident, apical anterodorsal bristle setulose. Wings with veins *R.* 4+5 and *M.* 1+2 nearly subparallel to wing margin; *m-cu* cross vein erect; costal thorn fine but well developed.

Length, 5.5 mm.

RECORD:—

1 ♂, Lake Naknek, Savonoski, Alaska, July 1919. (J. S. Hine)

Type in the collection of Professor J. S. Hine, Columbus, Ohio.

The males of this and the following species may be recognized by the characteristic appearance of thorax and abdomen. The mesonotum has a bluish black caste to the pruinescence, whilst

the pleura are contrastingly deep black; the halteres are blackened. The abdomen in both species is similar to that of *nobilis*, especially in regard to the shape of tergal marks. The males of *crepusculenta* differ from those of *comata* (p. 146) in that the thoracic vittæ do not continue cephalad of transverse suture.

***Limnophora (Spilogona) comata* new species**

MALE.—Parafrontals, parafacials, and cheeks silvery pruinose with dark reflections; antennæ and palpi black; frontal triangle polished; proboscis lightly pollinose. Thorax with mesonotum grayish pruinose, paler on humeral and notopleural callosities; with three brownish vittæ on presutural and postsutural areas; scutellum blackish; pleura blackened, notably on the mesopleural area. Abdomen grayish pruinose, with large expansive black marks on terga 1+2, 3, and 4, all of which coalesce more or less across the dorsocentral plane owing to brownish infuscation; tergum 5 with a conspicuous dorsocentral infuscation: basal sclerite of hypopygium grayish pollinose. Wings faintly tinged, more noticeably basad: calyptræ whitish: halteres blackened.

Eyes separated by a distance about as broad as that of third antennal segment; parafrontals almost contiguous at apex of frontal triangle; parafrontal bristles continued in series caudad to a level with apex of frontal triangle; parafacials at base of antennæ about as wide as breadth of third antennal segment; cheeks slightly higher than width of third antennal segment, well maintained caudad; third antennal segment about 1.75 times as long as broad; arista minutely pubescent.

Thorax with presutural acrosticals in two series, composed of 3 or 4 irregular pairs, setulose; with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen conical, with numerous fine longish bristles on caudal half of tergum 5 and on basal sclerite of hypopygium; terga 1+2 entirely blackish, tergum 3 with trapezoidal marks, tergum 4 with a similar but smaller marking, the blackish area along the cephalic margin much more restricted than on tergum 3, tergum 5 with an ill defined dorsocentral infuscation.

Fore tibia with no median posterior bristle, with apical posteroventral weak: mid femur with a series of 3 or 4 setulose bristles on basal third of anteroventral surface, with a series of longish bristles on proximal half of posteroventral surface; mid tibia with 2 posterior bristles: hind femur with a series of 4 or 5 bristles on distal half and 2 or 3 setulose bristles on proximal third of anteroventral surface, with 2 or 3 bristles on proximal third of posteroventral surface; hind tibia with 2 anteroventral, and 2 or 3 anterodorsal bristles, with no apparent weaker bristles on posterior surface, apical anterodorsal bristle setulose. Wings with veins *R*. 4+5 and *M*. 1+2 subparallel to wing margin; *m-cu* cross vein erect. Length 4.75 mm.

FEMALE, paler in color than male: parafrontals grayish with trace of brownish infuscation; parafacials and cheeks grayish; frontal triangle and

proboscis pollinose. Thorax grayish pruinose, opaque, with more or less brownish infuscation along the discal area of mesonotum, at basal angles of scutellum, and on mesopleura; thoracic vittæ obscured. Abdomen grayish pruinose, with distinctly separated brownish marks on terga 1+2, 3, and 4; tergum 5 with at most a trace of light brownish infuscation along the dorsocentral plane. Legs grayish black. Wings clear; calyptræ whitish; halteres deep yellow with more or less trace of purplish or blackish tinge.

Parafrontals with a few setulæ; parafacials at base of antennæ broader and cheeks higher than width of third antennal segment. Thorax with sternopleural bristles arranged 1:1. Abdomen with large subtriangular marks on terga 3 and 4; ovipositor with spinules on anal plates.

Fore tibia with no median posterior bristle; mid femur with no anteroventral bristles, with a series of bristles on proximal half of posteroventral surface; mid tibia with or without a short anterodorsal bristle, with 3 or 4 posterior bristles; hind femur and hind tibia with similar chaetotaxy as in male. Wings with costal thorns well developed; veins *R.* 4+5 and *M.* 1+2 gradually divergent towards wing margin; *m-cu* cross vein slightly sinuate, erect.

Length, 5.0–5.5 mm.

Type and allotype in the collection of Professor J. S. Hine, Columbus, Ohio.

RECORDS :—

1 ♂, 1 ♀, Katmai, Alaska, Aug. 1917; 2 ♀, Naknek Lake, Savonoski, Alaska, Aug. 1, 1919; 1 ♀, Aug. 1919. (J. S. Hine)

According to the male sex the species is most closely allied to *crepusculenta* from which it differs most noticeably in the form of the head and the extent of the thoracic vittæ as indicated in the key. The female of *comata* possesses a characteristic brownish infuscation along the median third of dorsum of thorax, and the ovipositor has a few stout spinules on anal plates.

Limnophora (*Spilogona*) *nigriventris* (Zetterstedt)

Aricia nigriventris Zetterstedt, Dipt. Scand., 1845 IV p. 1442.

Limnophora nigriventris Stein, Wien Entom. Zeitg., 1902 XXI p. 37.—Stein, Katalog Paläark. Dipt., 1907 III p. 672.—Stein, Arch. f. Naturgesch., 1914 (1913) Abt. A Heft 8 p. 28.—Stein, Arch. f. Naturgesch., 1916 (1915) Abt. A Heft 10 p. 105.—Ringdahl, Entom. Tidskr., 1918 XXXIX Häft 2 p. 174, 179

Limnophora monticola Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 152.

Melanochelia monticola Malloch, Canad. Ent., 1921 LIII p. 62.

Spilogona monticola Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII, 1925 p. 229.

RECORDS:—

4 ♂, White Mountains, (N. H.) no date (Morrison); 1 ♂, Mt. Washington, N. H., July 8, 1914; 2 ♀, at 2500 ft. July 24, 1915; 1 ♀, Glen House, N. H., July 15, 1915. (C. W. Johnson)

It was only when I saw the female of this species that I felt assured as to its true identity. In this sex the species is clearly defined, possessing the following strong characters. Frontal triangle polished; abdomen entirely blackish and glossy, in contrast the thorax is cinereous gray, pruinose; wings with cross veins densely clouded, costal thorn strongly developed. In addition the ovipositor has setulose hairs only on anal plates. The male superficially resembles the female in most of the above respects, differing in degree in that the abdomen has traces of pruinescence and indications of paired markings; the costal thorn is not so strongly developed, and the cross veins not so densely infuscated. In addition the hind femur possesses a series of 3 or 4 short bristly hairs on proximal half of posteroventral surface, which on account of their fine development may not be readily discerned, nor rightly evaluated.

In both sexes the scutellum has a few appressed setulose hairs on dorsal margin of lateral declivities adjacent the apical bristles, and the hind femur has the distal (preapical) bristle of the anterodorsal series situated at a markedly lower plane than those constituting the remainder of the series.

Limnophora (*Spilogona*) *arenosa* Ringdahl

Limnophora arenosa Ringdahl, Ent. Tidskr., 1918 XXXIX Haft 2 p. 155.

RECORDS:—

Alaska, 1 ♂, Naknek Lake, Savonoski, July 27, 1919. (J. S. Hine) 1 ♂, Anchorage, June 13, 1921. (J. M. Aldrich)
Montana, 1 ♂, Gallatin Mts., July 7, 1914. (5000 ft.)

Wyoming, 1 ♂, N. W. entrance, Yellowstone Park, Aug. 3, 1918. (A. L. Melander)

This species was described by Ringdahl from specimens captured in Lapland, and has hitherto not been recorded from North America.

The male specimen from the Gallatin Mountains, Montana, was sent to Mr. Ringdahl for examination, and he reported that he could find no external characters that would, in his opinion, justify its separation from *arenosa*.

There is a considerable degree of variation in the form of the abdominal marks in the above specimens, especially between those collected in Alaska and those in the Gallatin Mountains and the Yellowstone Park, but I am reluctant to believe that there is more than one species represented. In the case of the specimen from Anchorage, Alaska, the abdominal marks are more closely approximated on terga three and four, those on tergum three being trapezoidal, and those on tergum four smaller and subtriangular in outline. In both cases the inner margins are parallel. In the other specimens the abdominal marks on terga three and four are relatively smaller in area, are subequal, and are subtriangular in outline, the inner margins being slightly divergent cephalad. In addition, the Alaska specimens have the eyes more widely separated than in the remaining specimens.

All agree in having the characteristic foreshortening of the sublateral vittæ on mesonotum at the transverse suture, thereby restricting the number of vittæ on the presutural area to one, in having the contrasting blackish reflection of the scutellum with the bluish gray pruinescence of the mesonotum, in having a few setulose hairs on dorsal margin of lateral declivities of scutellum adjacent the apical bristles, in possessing two or three relatively fine longish bristles along apical margin of processes of sternum five, and by the rather short distal section of the proboscis which is polished at base but densely pollinose for the remainder of the surface.

The males of the species resemble most closely those of *denudata*, from which it may be distinguished by the possession of only the median vitta on presutural area of mesonotum,

whereas in *denudata* there are three narrow brownish vittæ on presutural area. The poor condition of the specimen representing *denudata*, the identity of which has been very kindly verified by Mr. J. E. Collin, precludes a further comparison between the species from being made.

***Limnophora (Spilogona) argentiventris* Malloch**

Limnophora argentiventris Malloch, Trans. Amer. Ent. Soc., 1920 XLVI No. 802 p. 149.

Melanochelia argentiventris Malloch, Canad. Ent., 1921 LIII p. 62.

RECORD:—

1 ♂, Sioux City, Iowa, May 6, 1918, taken at light. (C. N. Ainslie)

The above specimen agrees in every particular with the description of the type and the diagnostic characters given in Malloch's key, in that the abdomen in the male is densely whitish pruinulent, with no marks on the third visible tergum (tergum 4).

There is a large series of specimens before me from the Rocky Mountains which, in my opinion, belongs to this species, varying only in that the abdomen in the male has a pair of smaller blackish spots on tergum four as well as on tergum three. There are also minor differences in the shape of certain structures comprising the male genitalic appendages. I have not been able to see the type which is in the collection of the Biological Survey of the United States Department of Agriculture.

***Limnophora (Spilogona) argentiventris* var. *occidentalis*, new variety**

Similar in structure to *argentiventris* Malloch, differing essentially in the male in that the abdomen possesses a pair of small blackish spots on tergum three and four. Specimens from Colorado and New Mexico have a distinct brownish interrupted dorsocentral vitta between the abdominal marks, and on tergum five. In male specimens from Washington and British Columbia the dorsocentral vitta is indistinct, being evident in most specimens on tergum five only. There is a considerable variation in the width of parafacials and height of cheeks when viewed in profile. The eyes are relatively large, and in a number of specimens extend well forward to the parafacials and deep into the cheeks, resembling in this respect species of the genus *Gymnodia*. All the male specimens agree in the chaetotaxy of the thorax, the armature of the legs, and in the characteristic shape of the

processes of fifth abdominal sternum. The latter is a relatively long sclerite with a shallow emargination caudad. The processes become sharply attenuated apicad, being largely blackened and shining in appearance.

In the female the abdomen has small brownish spots on terga three and four, and a brownish dorsocentral vitta more or less evident when viewed from behind. The anal plates of ovipositor possess fine setulæ.

Type, allotype, and paratypes in the United States National Museum.

RECORDS:—

British Columbia, 1 ♂, Oliver, May 2, 1923; 1 ♂, May 4, 1923; 1 ♂, May 5, 1923; 1 ♂, May 16, 1923; 1 ♀, April 27, 1923. (C. B. D. Garrett) 1 ♂, 3 ♀, Fairmont, July 28, 1926. (A. A. Dennys)

Alberta, 5 ♀, Banff, Aug. 21, 1922. (C. B. D. Garrett)

Washington, 5 ♂, 5 ♀, Medical Lake, July 14, 1920; 1 ♂, 1 ♀, Lake Paha, June 20, 1920; 4 ♀, Coulee City, Sept. 3 1920. (R. C. Shannon) 1 ♂, Pateros, Aug. 3, 1919. (A. L. Melander) 1 ♂, Oroville, (no date). (Coquillett)

Wyoming, 1 ♂, Caso Firehole R., Yellowstone Park, Aug. 18, 1918; 1 ♀, Canyon Camp, Yellowstone Park, (no date). (A. L. Melander) 1 ♀, Yellowstone Park, July 25, 1916, elev. 7394 ft. (Mont. Exp. Sta.)

Colorado, 4 ♂, 4 ♀, Colo. 1527; 1 ♀, 1563; 1 ♂, 1 ♀, 1576. (Coquillett)

Nevada, 1 ♂, Ormsby Co., July '6, —. (Baker)

New Mexico, 2 ♂, 1 ♀, Socorro, (no date). (S. W. Williston)

Limnophora (Spilogona) cretans new species

MALE, grayish; parafrontals, parafacials, and cheeks silvery pruinose; frontal triangle whitish pruinose; frontal vitta black with whitish pollen; antennæ and palpi black; proboscis polished. Thorax grayish black, lightly pruinose, with two darkish streaks along the dorsocentral plane; scutellum entirely gray. Abdomen densely grayish pruinose, with a brownish caste; terga 1+2 with dark reflections on cephalic half; terga 3 and 4 with two small brownish black marks; with trace of a dorsocentral dark streak on all segments; fifth sternum thinly pollinose, blackish, subshining. Legs blackish, pulvilli tinged. Wings clear, veins yellowish brown; calyptre whitish; halteres yellow.

Eyes separated by a distance about equal to length of third antennal segment; frontal vitta but little narrower caudad, distinctly separating the parafrontals throughout their entire length; parafrontals in profile noticeably raised above margin of eye; parafacials at base of antennæ broader and cheeks ventrad of eye higher than width of third antennal segment;

parafrontal, ocellar, and vertical bristles stoutly developed; vibrissal angle with numerous stout coarse setulæ; third antennal segment small, narrow, but little longer than second segment, the latter with several coarse setulæ; arista minutely pubescent.

Thorax with stoutly developed bristles, with four pairs of postsutural dorsocentral bristles; presutural acrostical bristles in two closely adjacent series, and much stronger developed than the adjacent setulæ, bristlelike; sternopleural bristles arranged 1:2.

Abdomen cylindrical, gradually narrowing caudad; tergum 3 with small, widely separated, subtriangular marks; tergum 4 with marks smaller and less definitely shaped, confined to posterior half of tergum; fifth sternum with a broad, shallow emargination; sternum 2, 3, and 4 with a pair of well developed bristles adjacent caudal margin.

Fore tibia with 1 median posterior bristle: mid femur with a few weak bristles on proximal third of anteroventral surface, with a series of bristles on proximal half of posteroventral surface; mid tibia with no anterodorsal bristle, with 2 posterior bristles; hind femur with 2 or 3 anteroventral bristles, and 1 or 2 posteroventral bristles; hind tibia with 2 anteroventral, and 1 robust anterodorsal bristle, and with 1 weaker bristle on posterior surface. Wings with veins *R.* 4+5 and *M.* 1+2 divergent towards wing margin.

Length, 5 mm.

FEMALE, similar in color to male; thorax with no apparent vittae; scutellum entirely gray: abdomen largely discolored, making it difficult to detect markings, but with apparently brownish areas on terga 3 and 4; halteres yellow. Macrochaetae of head and thorax stoutly developed; parafrontals with numerous setulæ. Abdominal bristles short and weakly developed; ovipositor with fine setulæ on anal plates.

Fore tibia with 1 median posterior bristle: mid femur with 2 or 3 bristles on proximal half of posteroventral surface; mid tibia with 2 posterior bristles: hind femur with 1 or 2 bristles on distal third of anteroventral surface, and with 1 or 2 weak bristles on proximal third of posteroventral surface; hind tibia with 2 anteroventral, and 1 robust anterodorsal bristle, and with 1 weaker bristle on posterior surface.

Length, 5.25 mm.

RECORDS:—

1 ♂, Chin, Alberta, May 30, 1923; 3 ♂, 1 ♀, June 7, 1923.
(H. L. Seamans) Type in Canadian National Collection.

The species most closely resembles *brevicornis* Malloch, differing essentially in that the hind femur possesses one or two posteroventral bristles on proximal third, and the hind tibia has only one median anterodorsal bristle, whereas in *brevicornis* the posteroventral surface of hind femur is without bristles on

proximal third, and the hind tibia has two or more anterodorsal bristles. In addition, the male abdominal marks of *cretans* are smaller and not so sharply defined as in *brevicornis*, and in the female of *cretans* the ovipositor has fine setulæ on anal plates, whereas in *brevicornis* the anal plates possess stout short spines.

***Limnophora (Spilogona) rufitarsis* Stein**

Limnophora rufitarsis Stein, Arch. f. Naturgesch., 1920 (1918)
Abt. A Heft 9 pp. 46.51.

RECORDS:—

Alaska, 1 ♂, Naknek Lake, Savonoski, Aug. 14, 1919; 1 ♀, July 31, 1919. (J. S. Hine)

Alberta, 1 ♂, Waterton, Aug. 4, 1924; 1 ♀, Aug. 13, 1922.
(H. L. Seamans) 1 ♂, Jasper, July 25, 1923. (J. McDunnough)

Washington, 1 ♀, Chehalis, Aug. 25, 1911; 9 ♂, 3 ♀, Tacoma, Aug. 27, 1911. (A. L. Melander)

Oregon, 1 ♂, Hood Rapids, Mt. Hood, July 29, 1921. (A. L. Melander)

The species was described from Washington, and is evidently western in its distribution. The species is peculiar in that the fore tarsi at least are typically yellowish. In the above series of specimens there is a considerable degree of variation in the coloration of tarsi and tibiæ, both in males and females. In certain specimens the tarsi and tibiæ appear largely yellowish whilst in others they are largely blackish.

In the male the eyes are broadly separated by a narrow frontal vitta, the latter being as broad as width of third antennal segment; the ocellar and inner pair of vertical bristles are strongly developed, bristlelike; the buccal and vibrissal areas have only one or two setulæ adjoining the bristles; the mesonotum and abdomen are densely grayish pollinose, the former with a brownish median vitta, and the latter with deep seal brown, widely separated, marks on terga three and four. In certain specimens there may be a brownish dorsocentral vitta between the marks on terga three and four. The scutellum is densely grayish pollinose with traces of darker areas at basal angles. The calyptræ are yellowish.

The species superficially resembles *suspecta* Malloch, but that species has three pairs of dorsocentral bristles caudad of the transverse suture, and the eyes in the male are not so widely separated as in *rufitarsis*.

***Limnophora (Spilogona) placida* new species**

MALE, pale grayish with brownish markings; head with parafrontals, parafacials, and cheeks silvery pruinose; frontal vitta, viewed from below, with whitish pollen; frontal triangle and proboscis polished; antennæ and palpi black. Thorax grayish pruinose, with three narrow vittæ; scutellum largely grayish white, with trace of brownish areas at basal angles; mesopleura entirely grayish. Abdomen with dense pale grayish pruinose, opaque, with paired brownish marks on terga 1+2, 3, and 4, those on the fifth tergum not well defined; basal sclerite of hypopygium whitish gray pollinose. Legs grayish black, tarsi brownish tinged. Wings clear; calyptræ whitish; halteres deep yellow.

Eyes separated by a distance not greater than breadth of third antennal segment; parafrontals contiguous cephalad of ocellus; parafrontals with at most weak bristles on caudal half; parafacials at base of antennæ about equal to width of third antennal segment; cheeks slightly higher than breadth of third antennal segment, with a series of sparsely set setulæ and bristles along ventral border. Thorax with presutural acrosticals setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2. Abdomen cylindrico-conical, each tergum except the fifth with paired markings, those on terga 1+2 not well defined and more or less distinctly separated, those on terga 3 and 4 subequal in size, subtriangular in shape, the inner margins slightly divergent cephalad, markings on tergum 5 not well defined: first sternum with a few setulæ, fifth sternum deeply emarginate, with short bristles on apical region of processes.

Fore tibia with no median posterior bristle, with a weak apical posteroventral bristle: mid femur with at most 1 or 2 weak bristles on proximal third of posteroventral surface, with a series of posteroventral setulæ, the setulæ gradually increasing in length apicad; mid tibia with or without an anterodorsal bristle, with 2 posterior bristles: hind femur with 3 or 4 bristles on distal half of anteroventral surface, with 2 or 3 weak bristles, irregularly placed, at base of posteroventral surface; hind tibia with 1 or 2 anteroventral, and 2 anterodorsal bristles, with or without 1 or 2 weaker bristles on posterior surface. Wings with veins *R.* 4+5 and *M.* 1+2 slightly divergent towards wing margin, *m-cu* cross vein erect.

FEMALE, similar to male; head grayish white pruinose; parafrontals with brownish infuscation along border of frontal vitta; frontal triangle brownish pollinose. Thorax with three broader brownish vittæ, and in addition two lateral vittæ that are not so well defined; scutellum with brownish areas at basal angles. Abdomen with brownish dorsocentral vitta on tergum five.

Parafrontals with a few setulæ; parafacials at base of antennæ fully as wide as breadth of third antennal segment; cheeks higher than greatest breadth of parafacial. Abdomen with markings as in male, except that terga 1+2 are largely grayish pruinose, and the fifth tergum has a more distinctive dorsocentral vitta: ovipositor with spinules on anal plates.

Fore tibia with no median posterior bristle: mid femur with no bristles on posterior surface; mid tibia with or without a weak anterodorsal bristle, with 2 posterior bristles: hind femur with 3 or 4 anteroventral bristles on distal half, and 2 or 3 fine setulose bristles at base of posteroventral surface; hind tibia with 1 or 2 anteroventral, and 2 anterodorsal bristles, with or without 1 or 2 weak bristles on posterior surface.

Length, 5.5 mm.

RECORDS:—

Alaska, 1 ♂, Katmai, Aug. 1917; 1 ♀, Naknek Lake, Savonoski, July '19; 1 ♀, July 28, 1919; 1 ♀, July 31, 1919. (J. S. Hine)

Colorado, 1 ♂, Tennessee Pass, 10240 ft. July 9, —; 1 ♂, July 12, —. (J. M. Aldrich)

New Hampshire, 1 ♂, White Mts., no date. (Morrison)

Type and allotype in the collection of Professor J. S. Hine, Columbus, Ohio.

This species most closely resembles *arenosa* Ringdahl in being pale gray in color with noticeable vittæ and markings on thorax and abdomen respectively. However the species possesses a number of significant characters which should aid in its recognition. The thorax has four pairs of postsutural dorsocentral bristles; the first abdominal sternum has a few setulæ; the mid and hind femora have only 2 or 3 fine setulose bristles at base of posteroventral surface; the ovipositor of female is armed with spinules on anal plates. In addition the pleura are concolorous with mesonotum, and the halteres are yellowish in *placida*, whereas in *arenosa* and *comata* the pleura and halteres are largely darkened.

Limnophora (*Spilogona*) *setinervis* new species

MALE, blackish; parafrontals and parafacials deep velvety grayish pruinose, with a brownish black sheen at fusion of parafacials with buccæ; cheeks more lightly pruinose, with dark reflections; frontal vitta black, when viewed from below with trace of brownish pruinescence; frontal triangle and proboscis lightly pollinose; antennæ and palpi black. Thorax blackish, subshining, with trace of darker vittæ; humeral and noto-

pleural areas strikingly bluish gray pruinosecent; scutellum entirely black; pleura largely blackish. Abdomen with cinereous gray pruinosecence at cephalolateral angles of terga 3, 4, and 5; terga 1+2 entirely blackish, terga 3, 4, and 5 with paired black marks confined to dorsum, the markings more or less obscurely separated owing to infuscation on the intervening area; hypopygium, including the basal sclerite and fifth sternum, blackish, subshining. Legs blackish, pulvilli tinged. Wings smoky, slightly infuscated basad; calyptre tinged; halteres yellow.

Eyes separated by a distance greater than width of third antennal segment; parafrontal bristles continued in series caudad to a level with anterior ocellus; frontal vitta only slightly narrowed caudad, parafrontals distinctly separated throughout; parafacials slightly wider than average breadth of third antennal segment, but little narrowed ventrad; cheeks broad, well maintained caudad, in height about equal to length of third antennal segment, with a series of longish bristles and fine setulæ along ventral margin; third antennal segment slightly tapered apicad.

Thorax with presutural acrosticals setulose, with four pairs of postsutural dorsocentral bristles; sternopleural bristles arranged 1:2.

Abdomen cylindrical; markings on tergum 3 trapezoidal, on tergum 4 subtriangular, smaller and more constricted cephalad than marks on tergum 3, on tergum 5 obscurely subtriangular, smaller than those on tergum 4; fifth sternum deeply incised; processes broadly rounded, with fine longish setulæ and bristles, which become longer apicad; sterna 2, 3, and 4 with numerous long bristles.

Fore tibia with or without a median posterior bristle: mid femur with a series of fine short bristles on anteroventral surface, the bristles of which become more setulose and appressed distad, posteroventral surface with a series of bristles on proximal two-thirds; mid tibia with 1 or 2 anterodorsal, and 2 or 3 posterior bristles: hind femur with a series of 3 to 5 strong bristles on distal half of anteroventral surface, and, in contrast, with a series of short fine setulose bristles on proximal half, with a series of bristles on proximal half of posteroventral surface; hind tibia with 4 anterventral, 2 or 3 anterodorsal bristles, and with 2 weaker posterior bristles. All tarsi slender, longer than their respective femur; pulvilli large.

Wings with veins *R.* 4+5 and *M.* 1+2 divergent at wing margin, *m-cu* cross vein erect; costal setulæ well developed but not long; auxiliary vein with one or more setulæ on under surface proximad of humeral cross vein.

FEMALE, paler in color than male; parafrontals infuscated; proboscis pollinose; mesonotum as in male, blackish infuscated with trace of vittae; humeral and notopleural callosities strikingly bluish gray pruinosecent; scutellum grayish with brownish marks at basal angles. Abdomen grayish, lightly pruinosecent, abdominal marks brownish, less intensive than in male; terga 1+2 largely brownish, terga 3 and 4 with widely separated brownish subtriangular marks on dorsum, tergum 5 with a dorsocentral vitta; in addition terga 3, 4, and 5 have trace of brownish marks on venter. Wings hyaline, faintly tinged basad; calyptre yellowish; halteres yellow.

Parafrontals with numerous setulæ; ovipositor with fine setulæ on anal plates.

Fore tibia with or without a median posterior bristle: mid femur with a series of bristles on proximal half of posteroventral surface; mid tibia with 2 or 3 anterodorsal, and 2 or 3 posterior bristles: hind femur with a series of 4 bristles on distal half, and 2 or 3 setulose bristles on proximal third of anteroventral surface, and with a series of 2 to 4 fine short bristles on proximal third of posteroventral surface; hind tibia with 3 or 4 anteroventral, and 3 anterodorsal bristles, and with 2 or 3 setulose bristles on posterior surface. Tarsi slender, longer than their respective femur; pulvilli small. Auxiliary vein, as in male, with one or more setulæ on under surface proximad of humeral cross vein.

Length, 6.5 mm.

RECORDS:—

- 1 ♂, 1 ♀, Yakutat, Alaska, June 21, 1899. (Harriman Exp. '99. T. Kincaid) 1 ♀, Bonne Esperance, Que., July 14, 1929. (W. J. Brown)

Type and allotype in United States National Museum.

The species may be readily separated from any other North American species known to me by the presence of one or more fine setulæ on the under surface of the auxiliary vein proximad of humeral cross vein. The mesonotum has the humeral and notopleural callosities strikingly pale bluish gray pruinose in contrast to the darker infuscation of the discal area.

The parafacials in the male are noteworthy for the fact that the region adjoining the buccal area of cheek is characteristically occupied by a darkened patch or reflection in the pruinescence, and in the female the abdominal terga are peculiar in that each possesses a pair of accessory brownish marks on ventral surface in addition to the paired marks on dorsum.

Limnophora (*Spilogona*) *compuncta* (Wiedemann)

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- Aricia compuncta* Zetterstedt, Dipt. Scand., 1845 IV p. 1457.—Zetterstedt, Dipt. Scand., 1849 VIII p. 3284.—Zetterstedt, Dipt. Scand., 1860 XIV p. 6216.
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(To be Continued)